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INDIGENOUS FARMERS' RURAL-URBAN MIGRATION AND AGROBIODIVERSITY CONSERVATION.

EXPLORING CONNECTIONS IN THE BOLIVIAN ALTIPLANO NORTE

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Thesis submitted for the degree of PhD

2017

Department of Development Studies

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A Giacomo, Maria e Corrado

Declaration for SOAS PhD thesis

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Abstract

This study investigates the connections between indigenous people's migration and agrobiodiversity conservation in the Altiplano Norte of Bolivia. The Altiplano Norte is located in one of the centres of origin and biodiversity in the world, where smallholder farmers maintain in their plots a wide range of agricultural varieties and relevant knowledge. Around Lake Titicaca significant effort has been devoted, in recent decades, to the prevention of genetic erosion. However, the phenomenon of farmers' rural-urban migration, although predominant in the Altiplano Norte, has been accounted for only marginally with regard to on-farm agrobiodiversity conservation both within the initiatives coordinated and implemented by national and international stakeholders, and in the academic literature. In order to produce useful knowledge for a better understanding of farmers' relationship with agrobiodiversity today, this research explores the broader context in which indigenous smallholders operate, according to traditional practices, as well as to new stimuli and priorities. The space in which they live and the identities and aspirations that influence their choices and behaviours are characterised by an increased proximity, at both a physical and an ideal level, between the rural and the urban dimensions. Two trends are identified and analysed in this work: 1) agronomic simplification, observable in the Altiplano Norte as well as in other developing countries' regions, as part of a process of deagrarianisation; 2) agrobiodiversity reinvention, taking shape in a period in which the indigenous roots of Bolivia, native crops and traditional dishes experience a revival in discourse and food practices. Temporary and return migrants are important characters in this process, as innovators and crucial allies for scientists promoting agrobiodiversity conservation.

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Acronyms

ADA - Asociación Departamental de Antropólogos de La Paz

ADAMA - Asociación de Agropecuarios Multiactiva del Altiplano

AGRUCO - Agrocecología Universidad Cochabamba, Universidad Mayor de San Simón

APROCA - Asociación de Productores y Conservadores de Cultivos Andinos

ASITURSO - Asociación Integral de Turismo Santiago de Okola "Dragón Dormido"

CONAMAQ - National Council of Ayllus and Markas of Qullasuyu

FAO - Food and Agriculture Organization of the United Nations

FONTAGRO - Fondo Regional de Tecnología Agropecuaria

IFAD - International Fund for Agricultural Development

IICA - Inter-American Institute for Cooperation on Agriculture

INE - Instituto Nacional de Estadística

INESAD - Institute for Advanced Development Studies

INIAF - Instituto Nacional de Innovación Tecnológica Agropecuaria y Forestal

IRFOSS - Istituto di Ricerca e Formazione nelle Scienze Sociali

MIGA - Movimiento de Integración Gastronómico Boliviano

NUS - Neglected and Underutilized Species

PAR - Platform for Agrobiodiversity Research

PROFIN - Fundación para el Desarrollo Productivo y Financiero

PROINPA - Promoción e Investigación de Productos Andinos

PROSUCO - Asociación Promoción de la Sustentabilidad y Conocimientos Compartidos

SINARGEAA - Sistema Nacional de Recursos Genéticos para la Agricultura y la Alimentación

TIOC - Territorio Indígenas Originario Campesino

UMSA - Universidad Mayor de San Andrés

UPB - Universidad Privada Boliviana

UPEA - Universidad Pública de El Alto

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Note on language

In this thesis I use "village" and "community" interchangeably to indicate the smallest territorial entity in the rural Altiplano Norte. Aymara people call their places of origin "communities", "*comunidades*" (i.e. *comunidad Cachilaya*, *comunidad Coromata Media*, *comunidad Santiago de Okola*), according to the terminology introduced after 1952 with an agrarian reform that replaced a social organisation based on *ayllus* (pre-Incan local entities formed by a group of families linked by blood ties or other relationships) with one based on *comunidades*. *Comunidades* are often nothing more than groups of tiny houses, distant from each other and spread across a sparsely populated territory. However, people call each other *hermano/hermana* (brother/sister), share a sense of belonging, and manage collective resources jointly through traditional reciprocity-based decision-making mechanisms and self-established rules. Communities lack the appearance and the structure that are typical of a village (sometimes they are rather more similar to hamlets). Nevertheless, in this work I have opted for a mixed use of the terms "village" and "community" for a better fluency in reading.

Note on research ethics

In order to grant research participants anonymity and protection, their names were changed in this thesis.

Since the beginning of my PhD, I have intended to make this study available to research centres and platforms concerned with agrobiodiversity conservation, in particular to the scientists who are active in the area where my data collection work has focused. Through them, the indigenous farmers from the Altiplano Norte who participated in my research should ultimately be able to benefit from its findings.

1. Agrobiodiversity and migration. Why bother?

The importance of agrobiodiversity

Conserving agrobiodiversity is acknowledged today as a global challenge. Maintaining crop diversity, scientists argue, is "essential to ensure society can feed itself and respond to the biotic and abiotic challenges that face food production now and in the future" (Naylor 2006, p.281). Over the last decades worldwide attention has focused not only on the call for increasing food production to feed a growing population, but also on the need to make this increase sustainable, in order to prevent environmental degradation, climate change and an excessive simplification of agro-ecosystems (PAR & FAO 2011).

Agrobiodiversity has recently acquired recognition both in the framework of agro-ecosystems' adaptation and resistance in the face of climate change (Gruberg et al. 2013), and within the global mission of enhancing food security for people in marginalised areas (Pascual et al. 2011). Its preservation is claimed to be beneficial, whereas its loss can have serious repercussions on ecological and socio-cultural systems - it can make ecosystems more vulnerable, due to the loss of important functions such as the "maintenance of nutrient and water cycles, pest and disease regulation, pollination and erosion control" (Prabhu Pingali's Foreword to Kontoleon et al., 2009, p. xxi); it can reduce food systems' stability, with negative impacts on their long-term sustainability and on food security (*Ibidem*); it can weaken farmers' cultural identity and traditions, tightly connected with agrobiodiversity conservation and use (Howard et al. 2008).

The vital role of agrobiodiversity is stated in several international documents - the Convention on Biological Diversity, the 2004 International Treaty for Plant Genetic Resources for Food and Agriculture, the 1996 Global Plan of Action on Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture, and the 2011 Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture. Attention is placed particularly on the conservation and use of "neglected and underutilized" crops. It is acknowledged that "a wide food crop base is crucial for supporting local economies, traditions and cultures" and, above all, for providing farmers with options to deal with "whatever agricultural problems may emerge in the future" (Global Facilitation Unit for Underutilized Species 2007). In parallel, the possibility that numerous "neglected and underutilized" crops will be lost is exposed.

While products like rice, wheat and maize fulfil more than half of the global food energy needs, "minor" crops have been left with little space (Global Facilitation Unit for Underutilized Species 2007). Because they provide only a minor portion of families' income, due to low yields and difficult commercialisation, they are often unknown outside rural areas and the demand for them in urban markets is limited (Terrazas et al. 2005). As a consequence, gradual but significant erosion of genetic diversity has taken place at the global level during the last century. According to FAO, a 75% loss of crop genetic diversity has occurred within this timeframe, alongside an increase in people's dependency on a restricted range of crops (FAO 1993; Altieri et al. 1987; FAO 2010). Although they have been excluded for a long time from agricultural research and conservation carried out in developed countries - focused on the crops that are accountable for most food supply on a worldwide scale - "neglected and underutilized" species are, however, extremely important. They are adapted to particular growing conditions and, though marginalised at the global level, they are staples at the local level and contribute substantively, especially in developing countries, to food security and to nutritionally rich and well-balanced diets (Hermann & Heller 1997).

The role of smallholder indigenous farmers

Small-scale farmers around the world have conserved agrobiodiversity for centuries for a number of reasons - for crops' agronomic and consumption-related characteristics; as an expression of their lifestyle, traditions and cultural identity; for economic purposes. Today, both at the local and at the global level, the conservation of agrobiodiversity relies heavily on the activity and the efforts of smallholder producers, particularly of peasants[1] in developing countries (PAR & FAO 2011). The activities that they carry out for their subsistence are crucial for the maintenance of crop varieties, the promotion of sustainable diets and the resilience of agro-ecosystems (PAR 2010; Deruyttere 1997; Berkes et al. 2000).

Indigenous farmers' role in the conservation of agrobiodiversity is broadly acknowledged. Indigenous peoples are recognised as stewards of natural resources and biodiversity (IUCN Inter-Commission Task Force on Indigenous Peoples 1997; Convention on Biological Diversity - article 8, letter j; Convention on Climate Change and the Convention on Desertification - article 16, letter g and article 17 letter c); and as crucial actors in the promotion of sustainable development (the World Summit on Sustainable Development, held in Johannesburg in 2002, reaffirmed "the vital role of indigenous peoples in sustainable development" - Johannesburg

[1] The concepts of "smallholder farmers", "peasants" and "subsistence farmers" are discussed in 2.3.3.

Declaration on Sustainable Development, paragraph 25, 2002). Furthermore, with specific reference to agrobiodiversity, smallholder farmers are considered key actors in *in situ* on-farm conservation, which has recently gained prominence alongside *ex situ* conservation.

Although *ex situ* conservation has historically been privileged and prioritised in international scientific practice, it is now agreed that, when agricultural varieties are preserved in the same place where they are grown, not only genetic resources, but also agro-ecosystems and relevant knowledge and practices survive (Brush 1991; Brown 2000; Jarvis & Hodgkin 2000). This is extremely important for both ecosystems' health and human wellbeing (Jarvis et al. 2000).

Due to the crucial role of farmers, diversity changes together with producers' families and communities. Varieties are managed according to not only natural conditions, but also people's needs and interests. Because of the tight link between on-farm conservation of agrobiodiversity and its actual consideration and use amongst farmers, it becomes essential to understand what determines smallholders' choices, shaped by contingent factors, as well as by broader underlying dynamics that transform identities and societies.

The Lake Titicaca region, a centre of origin of crops … and of rural-urban migrants

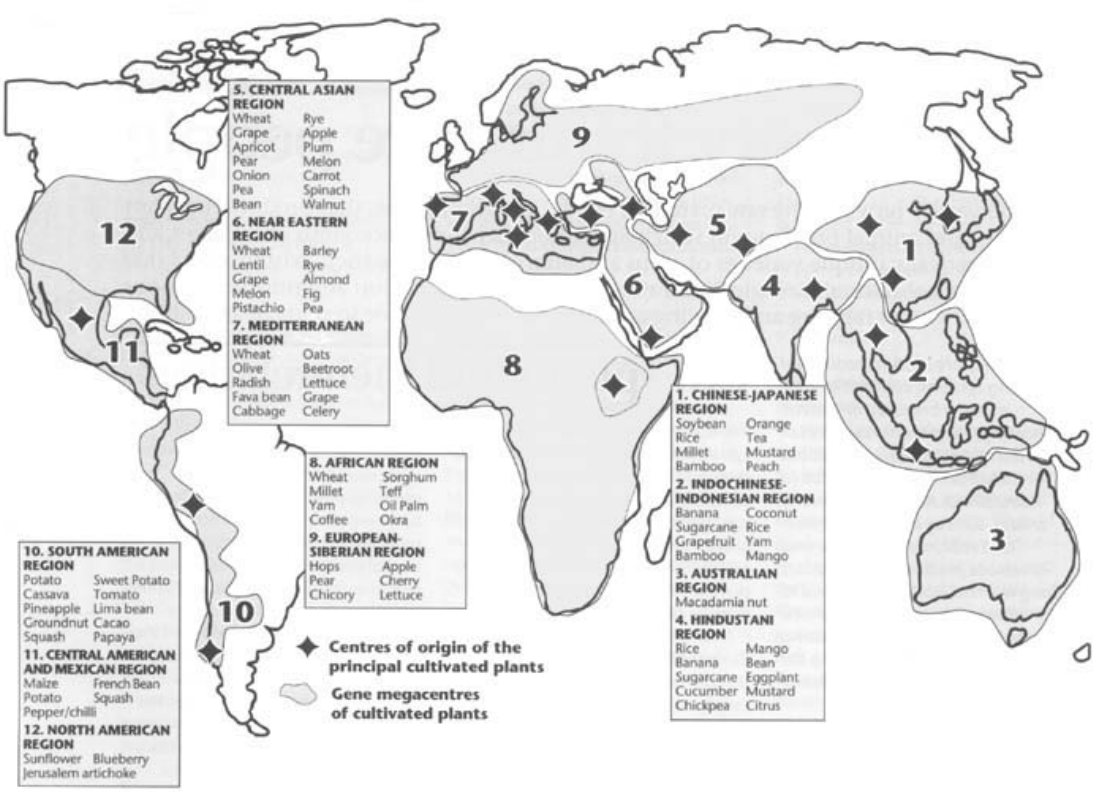
In this thesis I focus my attention on the Altiplano Norte of Bolivia, and particularly on the Lake Titicaca region. I look at migration, which involves numerous people in this area in the framework of an urbanisation and deagrarianisation trend. Migration affects the strategies and choices of indigenous farmers' families greatly. Producers' perception, use and - ultimately - conservation of agricultural varieties are strongly influenced by this phenomenon and by the transformations connected with it, which Aymara farmers are part of - either directly or indirectly.

The Altiplano Norte - in the heart of the Central Andes - is one of the centres of crop origin and biodiversity in the world (Gade 1999; Amend et al. 2008). Nikolai Ivanovich Vavilov, a Russian botanist and geneticist, who identified the places where "plant species, either domesticated or wild, first developed (their) distinctive properties" (FAO 2009 - ITPGRFA, article 2; Vavilov 1992), included this region among the eight places where agriculture developed independently (Paroda & Arora 1991; map 1.1). Based on elements such as the distribution and coverage of specific and intraspecific genetic diversity, the presence of crop wild relatives and parasites,

archaeology and history (Hawkes 1983)[2], he confirmed with his work De Candolle's indication that this was one of the "cradles of agriculture", where plant domestication took place (de Candolle 1886).

The so-called "South American Centre" (Vavilov 1992), including parts of Ecuador, Peru and Bolivia, is still home to numerous varieties of root tubers, grains, vegetable crops, fruit and fibre plants. In Bolivia alone, 1555 varieties of potato and 3108 varieties of quinoa are currently conserved *in situ* and *ex situ*, alongside varieties of other species, such as oca, isaño, papalisa, cañahua and tarwi (INIAF 2014b). In the Lake Titicaca region small-scale farmers conserve in their fields an extremely rich agricultural diversity, as they have done for generations to guarantee their own subsistence. This is why I chose this specific area for my research.

Map 1.1: Centres of origin of food crops and genes 'megacentres'



FAO 1993.

[2] Centres of origin of crops and centres of diversity have for long been considered as overlapping. However, recently disagreement about this has emerged, mainly because gene flows from centres of origin arguably made domestication take place in different areas (Dvorak et al. 2011).

This region currently experiences an intense movement of people from rural to urban areas, not compensated - in terms of steadiness and numbers - by an equal return flow (Tannuri-Pianto et al. 2004). Since the 1950s indigenous farmers have been pushed away from their communities by the low agricultural productivity of the Altiplano - caused by harsh climatic conditions, soil erosion and land fragmentation - responsible for a situation of chronic food insecurity, poverty and vulnerability. This was also due to insufficient public investment, infrastructure, and education and health facilities. At the same time, cities have attracted a growing mass of migrants, through employment and income-generation opportunities available in factories and urban enterprises, or in the commerce and service sectors. The desire to improve their living conditions is still the main incentive of most rural-urban migrants, particularly youth (Urioste F. De C. 2003; Eyzaguirre et al. 2004; López Levy 2001; Pérez-Crespo 1991; Thornett 2009).

The justification for this work

The phenomenon of rural-urban migration has acquired an impressive scale in the Altiplano Norte. El Alto is today the fastest growing city in Bolivia (Instituto Nacional de Estadística 2014; CEPAL 2005) and rural people are increasingly connected with and gravitating towards urban areas. This bears multiple consequences for indigenous farmers' families and communities, embedded in networks and relations that span the rural and urban dimensions.

As I could ascertain through an analysis of the literature, migration is not explicitly taken into account in the conservation strategies implemented in this area. Firstly, with the exception of a few studies (Van Dusen 2005; Zimmerer 2014[3], 2013; Velásquez-Milla et al. 2011), published

[3] In this publication Zimmerer applies a cultural landscape framework to the study of maize agrobiodiversity in the department of Cochabamba, Bolivia. He acknowledges that an "integrated analysis of the combined socio-ecological functions and use of landraces tied to the changing context of smallholder cultural landscapes is a sizeable gap in both current research and the analysis of options for agrobiodiversity management and in situ conservation". He looks at migration (particularly at international migration) as an element that is part of the same picture as agrobiodiverisity conservation. This highlights that there are indeed similarities between my research and Zimmerer's work - published in 2014. Nevertheless, important differences in focus and findings also exist. Firstly, Zimmerer is concerned with the conservation and the use of agrobiodiversity in the Bolivian Andes, but, he looks exclusively at maize diversity and focuses on "the tropical mountains and foothills" of the area of Valle Alto. Here agro-ecosystems differ considerably from the Altiplano Norte's in terms of climate, products, technology and social dynamics. Secondly, while he does investigate the consequences of migration, the type of migration that he encounters in this area is mostly international (in 89% of the surveyed households; particularly to the United States). This generates consequences on migrants' towns of origin (i.e. the inflow of remittances; an increased use of machinery and improved irrigation; the use of field caretakers and in-migrant workers to replace absent men) that I could not observe in my fieldwork area. Zimmerer's approach to agrobiodiversity conservation is close to mine. Like I do (as the next chapters will show), he considers agrobiodiversity as having "emergent social-ecological properties" rather than as "static or residual". His framework, which allows him to investigate the "linkages to livelihood groups

work concerning agrobiodiversity conservation in different geographic contexts tends to relegate migration to the status of a marginal element within the composite socio-economic scenario in which farmers operate (Padulosi et al. 2011; Jarvis et al. 2000; de Haan 2009; Malice & Baudoin 2009; Brush 1992; Sthapit et al. 2006; Jarvis et al. 2011; Bebbington 2001; Eyzaguirre et al. 2004; Requier-Desjardins 2010; Steinberg & Taylor 2002; Taylor et al. 2006; Winters et al. 2006; Zimmerer 1991). Secondly, in spite of its consequences for subsistence agriculture and, particularly, for on-farm agrobiodiversity conservation practices, policies and projects designed for the specific Altiplano region disregard it, overall maintaining a narrow focus on rural households and communities, which detaches farmers from the broader socio-economic and political rural-urban reality that surrounds them[4].

Around Lake Titicaca the activity of organisations concerned with on-farm agrobiodiversity conservation has recently intensified, after centuries of native crop marginalisation and despite scientists' efforts - between the 1950s and the 1970s - to modernise agricultural production as part of Bolivia's national development scheme, resulting often in agronomic simplification. Particularly since the 1990s national initiatives and internationally funded programmes [5] have increasingly targeted indigenous communities with the purpose of promoting and supporting local peasants' conservation work and use of agricultural varieties, especially native ones.

Such interventions have overall acknowledged the important impact of socio-economic issues on Aymara farmers' livelihoods and customs (Mamani Alvarez 2011; Mamani et al. 2010;

being formed through non-traditional activities, such as migration", relies - like my own - on the concept of "new rurality". As a result, the broad sense of his conclusions and recommendations for the future management and policy options, draws from considerations that coincide with some of mine (chapter 8, "*Recommendations for future research*"). Despite these common aspects, the distinctiveness of my study lies in my methodological and operational choice of looking specifically at agrobiodiverisity-migration *connections* within the complex reality of the Altiplano Norte *desakota* space. I adopted a theoretical lens (chapter 3) through which I could identify – by using primary data - the multiple and multi-directional mechanisms bringing these two elements together in that specific context.

[4] NGOs and technical staff operating in the field are well aware of the challenges and opportunities for Aymara small-scale producers generated by migration (see 6.3.2). This is partially reflected by their reports to supervising agencies and donors (PROINPA's Annual Report for IFAD NUS III 2012; PROINPA's 2006-2007 annual report for SINARGEAA). However, the specific effects of this phenomenon are never discussed in detail in these documents, as issues that are perceived to be more relevant to conservation projects' activities are given most space.

[5] Some examples are the projects IFAD NUS I (2001-2004), II (2007-2010), III (2011-2014), funded by the International Fund for Agricultural Development and coordinated by Bioversity International; Andescrop (2010-2013), a conjunct initiative among the Faculty of Science of the University of Copenhagen (Denmark), the Faculty of Agronomics of UMSA (the "Univerisidad Mayor de San Andrés" of La Paz) and the Bolivian PROINPA (*Fundación para la Promoción e Investigación de Productos Andinos*); the regional initiatives of FONTAGRO (Regional Fund for Agricultural Technology); the PES scheme-related "Payments for Agrobiodiversity Conservation Services" projects implemented between 2009 and 2011; the genetic richness conservation initiatives of INIAF (*Instituto Nacional de Innovación Agropecuaria y Forestal*).

Taranto & Padulosi 2009; Rojas et al. 2010). However, rural-urban migration has never gained explicit consideration. This is striking in a fast-changing area such as the Altiplano Norte, in which migration is extremely widespread amongst indigenous people and a novel multi-faceted relationship between countryside and cities that is reshaping boundaries and identities.

My work was inspired by 1) the identification of a gap in the literature, given by a lack of attention to migration when studying and pursuing on-farm agrobiodiversity conservation; and 2) my intention to highlight and analyse the mutual influence and connections that exist between agrobiodiversity conservation and socio-economic change through the lens of migration. The specific focus on rural-urban migration stems, in particular, from the prominence that this phenomenon has in the contemporary Altiplano Norte. When working with smallholder indigenous farmers in this region it is impossible to ignore the direct and indirect consequences that it has on their livelihoods and choices.

The research objectives

In international research for development organisations scientists and policymakers strive to achieve - in different geographical contexts - the dual objective of, on one hand, fostering an effective conservation of agricultural genetic resources on farm, and, on the other hand, ensuring that farmers in developing countries enjoy a condition of wellbeing while taking an active role in conservation (Jarvis et al. 2011; Narloch et al. 2009; Pascual et al. 2011; Kontoleon et al. 2009a). As some authors claim, in order to accomplish this mission, it is crucial to understand the context in which farmers operate not only from an environmental perspective, but also from a social, economic and political point of view (Zimmerer 2014; Malice & Baudoin 2009).

My work intends to produce new knowledge that can usefully inform scientists and policymakers about the nature of the "rurality" (De Grammont 2008; Kay 2008) in which Altiplano Norte farmers currently operate. It is important that issues such as rural-urban migration, influencing and altering the rural world, are taken into due consideration when designing and implementing initiatives driven by the above-mentioned objectives in this area. By shedding some light on the connections that exist between rural-urban migration and agrobiodiversity conservation performed on farm by indigenous smallholders, possible options

for dealing effectively with the challenges and opportunities generated by migration can emerge more clearly.

Although my work seeks to highlight the connections between on-farm agrobiodiversity conservation and migration with specific reference to the Lake Titicaca region, it also wishes to bring attention to dynamics that - while disregarded by scientists so far - could be relevant to other parts of the developing world. The same mechanisms of connection that I discuss in this thesis are likely to exist in other contexts in which rural-urban relations are undergoing similar changes to the Altiplano Norte. Strictly contextual findings aside, the theoretical assumptions, methodology and analytical approach used in this research, as well as the empirical realities that are uncovered, can generate useful insights beyond my specific focus area.

The central research question that has guided my work summarises my principal scientific objective: "*What are the connections between indigenous farmers' rural-urban migration and agrobiodiversity conservation in the Altiplano Norte of Bolivia?*".
The phrasing of this question reflects my conscious decision to look at *connections*, and to adopt a perspective that is as open and multi-directional as possible. Although my investigation concentrates on rural indigenous communities, I have kept a wide focus throughout the whole research process, in order to grasp to the best of my ability the multiple linkages and mutual influences that exist between agrobiodiversity conservation and migration. I deliberately did not aim for an assessment of *effects* or *impact* (of migration on agrobiodiversity conservation) with the purpose to 1) avoid my analysis to be limited to the verification of linear causality between these two elements; 2) account for the multi-directionality of the interactions between different components of a complex picture; 3) delineate this picture in the qualitatively and quantitatively clearest and most accurate way, by identifying existing mechanisms of connection. Section 3.3 explains how the choice to investigate *connections* was operationalized for the purpose of data collection and analysis.

A final clarification concerning the notion of migration adopted in this work is necessary already at this stage, although it anticipates an issue that I discuss in detail in the next chapter (2.4.1). 'Rural-urban migration' signifies the physical movement of people from a rural place of origin to an urban place of destination. However, it includes more than that. It refers to a broader picture that encompasses a series of transformations underway in the Altiplano Norte: urbanisation, deagrarianisation, livelihood change, formation - through an *in situ* urbanisation of the countryside and a ruralisation of tastes and preferences in the city - of new spaces and

identities that are neither rural nor urban. I explain and analyse these processes in chapters 3 and 4.

The thesis outline

This thesis begins by presenting some empirical information that the reader needs in order to understand the different elements of my research question. Chapter 2 includes some instrumental definitions and information concerning 1) Bolivia and the Altiplano Norte, with particular attention to the fieldwork sites; 2) indigenous farmers; 3) rural-urban migration; and 4) on-farm agrobiodiversity conservation in Aymara communities. Regional literature and primary data are used to delineate the setting of the analysis presented later on and introduce key issues.

Chapter 3 explains the theoretical and methodological approaches I have used to make sense of the complex picture of inter-connections between on-farm agrobiodiversity conservation and rural-urban migration. First, I discuss the contribution of political ecology and agroecology in the exploration of the society-nature interface. I combine agrarian change literature, looking at structural transformations, with a perspective that emphasises the role of human agency and people's micro-level strategic responses to broader dynamics. This generates two different but inter-related strands of connections - those that fall under agronomic simplification, on one side, and those ascribable to a "reinvention" of agrobiodiversity, on the other side. The first ones are generated by a pull towards urbanisation and deagrarianisation, a diversification of livelihoods, and an abandonment of subsistence agriculture; the second ones are triggered by a process of "repeasantization" and "indigenous modernities" creation. Critically, the study of neither the first nor the second trend entails a neat analytical separation between the rural and the urban dimensions, or a predominance of one above the other. To grasp the transformation of both rural and urban realities and the fact that in the Altiplano Norte these two dimensions are getting physically and ideally closer to each other, concepts like "new rurality" and *desakota*[6] are used, as they help to frame the study of the new emerging interactions between agrobiodiversity conservation and migration. In the second part of the chapter I discuss the methodology that I chose for my research. I explain how I operationalized my focus on *connections* through the identification of mechanisms that link agrobiodiversity conservation with rural-urban migration; then, I illustrate the data collection methods that I

[6] These concepts are explained and discussed in detail in 3.2.2.

applied in the field; finally, I assess the main limitations I encountered during my fieldwork and the expedients I used to tackle them.

Chapter 4 introduces the reader to the Altiplano Norte *desakota* region, including the cities La Paz and El Alto and the surrounding rural areas that increasingly gravitate towards them. In this chapter I argue and show through evidence that due to the growing proximity between rural and urban areas both "rural-ness" and "urban-ness" change, acquiring characteristics of each other, and generating new spaces of interaction and exchange and identities that straddle rural and urban categories.

Chapter 5 analyses agrobiodiversity conservation and use in the Lake Titicaca region. I start by describing what agrobiodiversity is composed of in the Aymara communities Cachilaya, Coromata Media and Santiago de Okola, the three rural sites where I focused my data collection activity. Then, I explain how seeds, practices and knowledge are transmitted horizontally and vertically in indigenous villages, and what pushes farmers to conserve them. The message I convey through this chapter is that - within a "new rurality" - traditional and novel channels of seed and knowledge acquisition and exchange coexist in rural communities. Farmers' interaction with external actors (i.e. NGOs, scientists, urban migrants) and their proximity to cities and markets make new stimuli and priorities shape their choices concerning agricultural varieties' conservation.

Chapter 6 and 7 are empirical chapters that deal with the analysis of *connections*. Chapter 6 discusses the mechanisms of connection between agrobiodiversity conservation and rural-urban migration that foster a process of agronomic simplification in the Altiplano Norte. In contrast, chapter 7 examines how agrobiodiversity "reinvention" takes shape in this region. Both chapters aim at showing through qualitative and quantitative data the multiple consequences of rural-urban migration, analytically "unpacked" through "*in situ* urbanisation" and "ruralisation" - affecting lifestyle, preferences and customs -, and temporary, permanent and return migration.

Finally, chapter 8 presents the conclusions of this thesis by condensing and discussing its main findings, and suggesting avenues for future research.

2. “Indigenous farmers”, “migration”, “agrobiodiversity conservation”. The Altiplano Norte empirical setting

2.1 Introduction

In this chapter I outline the empirical setting of my research. To do so I use secondary data, obtained through a review of the existing literature and archival research in Bolivia, as well as primary data, collected in 2012-2013 during my fieldwork in the Altiplano Norte.

I start by presenting the research area. First, I focus on geographical and environmental aspects, useful for understanding the characteristics of the agricultural sector in the fieldwork sites. Then I briefly sketch the social, political and economic scenario of contemporary Bolivia, to contextualise rural-urban migration of Altiplano Norte farmers. I begin by looking at the country level and then I zoom in to my specific region of interest, presenting the fieldwork sites.

The chapter continues by providing definitions and preliminary information for each one of the integral elements of the research question. The first element I take into consideration is ‘indigenous farmers’. In the Altiplano Norte these people are characterised by a strong ethnic identity, traditionally associated with specific livelihoods, challenged by phenomena like migration. It is important to clarify how farmers’ “indigeneity” comes into play within Bolivia’s specific socio-political context and with reference to new scenarios in agrobiodiversity conservation. The second element is ‘rural-urban migration’ - approached in this thesis with a broad-encompassing perspective - which I frame with reference to the research area, by highlighting some key trends and figures. Finally, I explain what ‘on-farm agrobiodiversity conservation’ is and how it is performed.

2.2 Bolivia and the Altiplano Norte

2.2.1 Environmental and ethnic diversity

Bolivia is a landlocked country in South America, bordering Argentina, Brazil, Chile, Paraguay and Peru. Its territory is one of the most geographically and environmentally diverse in the world, as it is composed of high mountains (the Andean region), hills (the sub-Andean region)

and tropical forests (the plains region) (Proyecto Ensayo Hispánico 2014; CIA 2014; Vera 2006; Montes de Oca 1997; INE 2014).

1) The mountain region occupies about 28% of the country's total area. It includes the two Bolivian branches of the Central Andes - the Western Range (*Cordillera Oriental*) and the Eastern Range (*Cordillera Oriental* or *Real*), whose altitude reaches 6,542 metres above sea level with Nevado Sajama. The Altiplano, a high plateau with an average altitude of 3650 m.a.s.l. lies between the two ranges. Lake Titicaca, the highest navigable lake in the world (3810 m.a.s.l.), shared with Peru, is located here. While the Western range has a scarce population in its Northern part and almost none in its Southern part, the Altiplano corridor and the Eastern slopes are densely populated. Here is where the biggest cities of Bolivia are located - La Paz, El Alto, Potosí, Oruro, Cochabamba.
2) The hills region (13% of the total territory) includes the Yungas (warm valley, in Quechua), a transitional zone between highlands and flats, with warm and temperate but humid climate, forests, and an average altitude of 2500 m.a.s.l.
3) The plains region (59%) stretches from the Northern part of the country (where the Andes end), to the South-Eastern border (with the river Paraguay basin). It is covered with forests and its climate is tropical and humid. Although it is the largest geographical region of Bolivia it is sparsely populated.

Climate, landscape and vegetation vary according to altitude. The Western part of Bolivia is cold and semi-arid with cold dry winters and warmer summers, characterised by precipitation. In spite of its desert-polar features and scarce vegetation, in the North-Eastern part, including the Lake Titicaca basin, rainfall is sufficient for practicing agriculture. In the Eastern lowlands, instead, summers are hot and humid and winters are temperate. Precipitation and vegetation are abundant (Vera 2006).

Agricultural production is also diverse, as it changes according to altitude and environmental conditions. In the Western highlands it focuses on native tubers and grains and on non-native cereals and legumes. Farmers rear camelids (llamas and alpacas), sheep and cattle. In the Yungas agriculture relies on fruit, coffee, cocoa, coca and other tropical products. In both the Altiplano and the valleys farming is mostly of the subsistence type and it is practiced on a small-scale. Suffice to say that, according to the International Potato Centre, in Bolivia overall potatoes, the main staple in the Andean diet, are produced "on approximately 130,000 hectares of land […] by over 200,000 farmers […], of whom approximately 80% cultivate less than one hectare of potato each year" (International Potato Centre 2006). In the Eastern

lowlands, instead, cash crops like soya, rice, wheat, cotton, oilseeds and sugarcane are at the centre of an intensive and export-oriented system. Cattle are also bred for large-scale meat production (Hudson & Hanratty 1989; Vera 2006; DANIDA 2014; Barja Berrios & Cardozo Gonsálvez 1971). While it accounts for only 13.1% of the national GDP, agriculture in Bolivia engages about two fifths of the workforce, almost 60% of which lives in the Altiplano (New Agriculturalist 2013). The rest of the GDP is generated by industry (38.9%) and services (48% - CIA 2014).

Map 2.1: Physical map of Bolivia - research area marked with a red circle

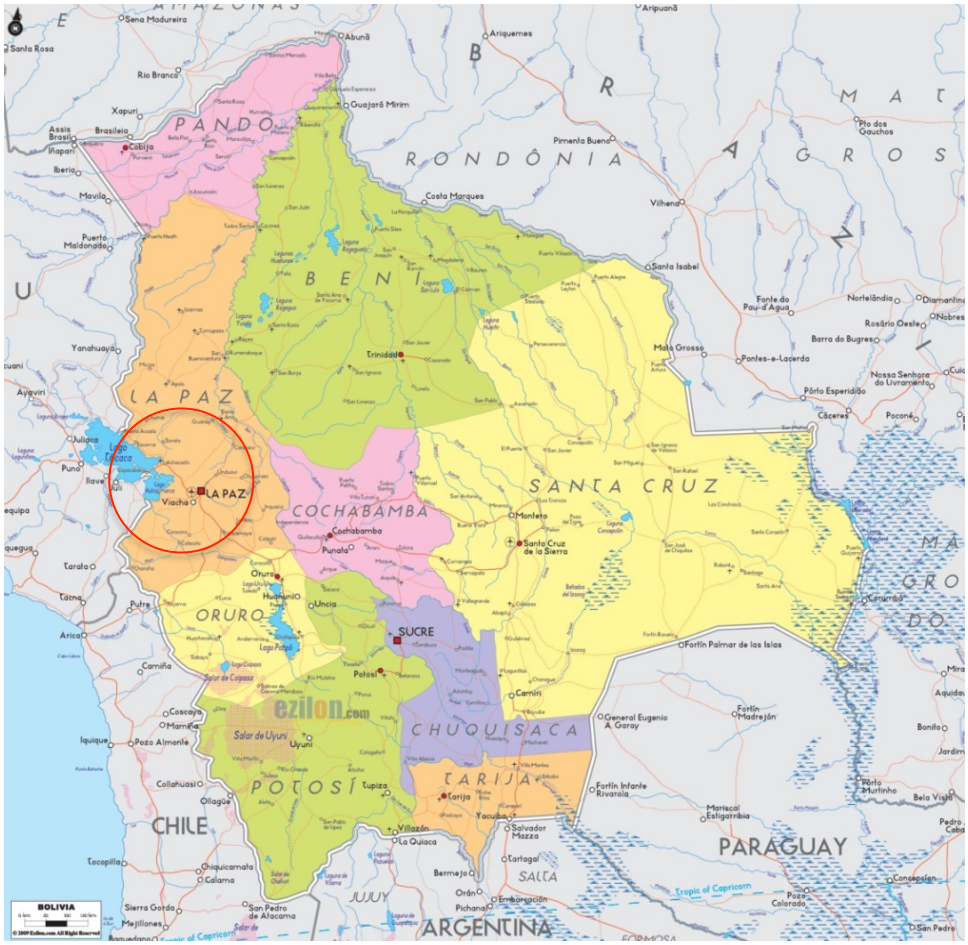
Own elaboration from Ezilon Maps 2014.

According to the last census - the 2012 "*Censo Nacional de Población y Vivienda*" - the total population of Bolivia is of 10.027.254 people (INE 2013). Demographic growth has been rapid in recent times, and over the last 62 years the number of total inhabitants has increased fourfold with a particular concentration in urban areas (mainly in Santa Cruz, La Paz and El Alto).

Since 2009, when a new Constitution was approved, Bolivia's official name has been Plurinational State of Bolivia, to indicate that the nation is composed of different ethnic groups

that not only create a multi-ethnic and pluricultural state, but also share a single identity[7] - the plurinational one (Zeballos Ibáñez 2011). From an ethnic point of view the Bolivian population is heterogeneous. It is composed of Quechua (30%, 1.281.116); *mestizo* (mixed white and Amerindian ancestry - 30%); Aymara (25%, 1.191.352 people); white (15%), and other indigenous people belonging to groups like the Guaraníes, the Chiquitanos and the Mojeños (CIA 2014; La Razón Digital 2013). The Constitution of 2009 recognised Spanish and the 36 indigenous languages spoken in Bolivia as official national languages (*Constitución Política del Estado Plurinacional de Bolivia* 2009). This was a historical change in a country where 31% of the citizens self-declare as indigenous, belonging to one of the 36 ethnicities listed in the Constitution.

Map 2.2: Political map of Bolivia - research area marked with a red circle



Own elaboration from Ezilon Maps 2014.

[7] Article 1 and 2 of the 2009 Constitution.

2.2.2 The Altiplano Norte - presentation of the fieldwork sites

My study focuses on the Northern part of the Bolivian Highlands, particularly on the area surrounding Lake Titicaca, in the department of La Paz, as indicated in maps 2.1 and 2.2. La Paz and El Alto are the main cities in this region. I provide information about them and their recent transformation due to population growth and in-migration from rural areas in 4.2.1.

In 2012-2013 I conducted my fieldwork in these two urban areas and in the surrounding countryside, collecting qualitative and quantitative data in three Aymara communities in particular:

1. Cachilaya, *provincia* Los Andes, *municipio* Puerto Pérez - 16° 20' 0" S, 68° 37' 0" W; altitude: 3839 m.a.s.l.;
2. Coromata Media (Coromata[8]), *provincia* Omasuyos, *municipio* Huarina - 16° 8' 17.84" S, 68° 32' 28" W; altitude: 3957 m.a.s.l.;
3. Santiago de Okola (Okola), *provincia* Camacho, *municipio* Puerto Carabuco 15° 51' 55,1" S and 69° 00' 04,4" W; altitude: 3830 m.a.s.l.

Map 2.3: Cachilaya, Coromata Media and Santiago de Okola

Created with Google Earth 2015.

[8] The adjective "*media*" ("middle"/"intermediate") serves the purpose of distinguishing this community from Coromata Alta ("High Coromata") and Coromata Baja ("Low Coromata") in the same area. However, when the possibility of confusion amongst the three does not exist, even its inhabitants shorten their community name to Coromata only. The same applies to Santiago de Okola - Okola, the part of its name that distinguishes it from other communities (i.e. Santiago de Huata).

These communities are identified as "micro-centres of diversity" (PROINPA, Informes SINRGEAA; Rojas et al. 2010; 5.3), because their territory hosts a great genetic richness in a tiny space. The Fundación PROINPA (*Promoción e Investigación de Productos Andinos*), which supported my fieldwork, has been present in these villages over the last ten years, although in 2012-2013 it was only active in Cachilaya and Coromata[9]. To select the fieldwork sites I took into consideration a number of villages among those where PROINPA could offer me some initial assistance due to its previous or on-going work (3.3.2). My choice fell on Cachilaya, Coromata and Okola because, although the three of them were Aymara communities of a similar size from a demographic point of view and "micro-centres of diversity", they presented geographical, environmental and welfare characteristics that made them different from each other. Research-wise they offered - if considered together - an interesting diversity, and a sufficiently accurate cross-section of the Altiplano Norte rural world.

Cachilaya, Coromata and Okola are representative case studies of the Altiplano Norte. Firstly, they are characterised by the same language, historical background and traditions as the other Altiplano Norte Aymara communities. In ancient times the area in which the three of them are situated was part of the Aymara Empire's territory, later on ruled by the Incas and included in the *Qullasuyu* (the largest portion of the Inca Empire with its centre in the Lake Titicaca region). Today they are embedded in an administrative structure that sees them among the smallest units (*comunidades*) within their *municipios* of belonging (each one of them divided into *subcentrales*, in turn composed of *cantones*). *Comunidades* - since the 1952 agrarian reform - have been organised based on the structure of an agrarian union (*sindicato agrario* - PDMs Huarina 2012 and Batallas 2011). Although - as explained in the "*Note on Language*" at the beginning of this thesis - this structure replaced the ancient *ayllu* configuration, a number of aspects linked with the traditional *ayllu*'s arrangement and lifestyle can still be observed in Cachilaya, Coromata and Okola, just like in all other Altiplano Norte rural communities (Mamani Alvarez 2011). Traditional authorities are chosen yearly according to a rotation-nomination system. They are in charge of supervising on the wellbeing of community members and the management of collective resources. Furthermore, although people declare themselves as followers of different religions (in the communities where I worked most inhabitants said they were catholic, but there was also an evangelic minority), it is evident -

[9] PROINPA, although it still provides occasional support to Santiago de Okola on specific issues, no longer focuses its work on this community. Efforts were directed towards other villages, where no other initiatives (like agro-tourism) are in place at the moment.

particularly in the moments of the collective life linked with agricultural activities and festive events - that Aymara farmers consider pre-Hispanic traditions and indigenous pantheistic rituals extremely important. In the three sites - just like in the other Aymara communities of the Altiplano Norte - agriculture is the main livelihood. Land is divided into private and collectively owned (5.4). Throughout the Altiplano Norte, in Aymara communities, the different types of land are called with the same indigenous names and managed according to similar mechanisms. Finally, Cachilaya, Corormata and Okola face the same challenges as the other rural villages of the region: climate change and unreliable precipitation; land fragmentation (4.2.2); out-migration and depopulation. As I explain further below - although representative case studies from the same region - they differ slightly in climate, welfare and agricultural production (see also "*Inter-specific diversity in the three rural fieldwork sites*" in 5.3.1). However, due to the numerous similarities, agrobiodiversity conservation and migration connect in the three villages in similar ways[10].

Cachilaya is on the Southern shore of Lake Titicaca. It is 57 km away from La Paz (roughly one hour and half by car from the city centre). Most houses are concentrated around the school (primary and secondary) and the community centre, although many are scattered across a quite large area. The territory is slightly hilly and the presence of the lake makes the climate relatively mild. The population counts 340 men and 341 women, for a total of 221 families.

Coromata is situated at a higher altitude and it is not on the lake. This makes the climate drier. It is 75 km distant from La Paz (a two hour trip by car). Houses and huts are scattered in a flatland, beaten by strong winds. The total population is of 139 women, 109 men and about 60 children, for a total of 120 families.

Okola is on the lake, farther away from La Paz than Cachilaya and Coromata (about three and a half hours by car). Since 2006 it has hosted a community agro-tourism project. It has a population of 157 men and 135 women for a total of about 151 households (PROINPA reports 2006-2010; Alarcon Vicente 2011; Torresin 2010).

Amongst the three, Coromata is the poorest community. Here people own less livestock and meals are simpler than in Cachilaya and Okola. For example in farmers' *aphtapis* (shared meals of the indigenous Andean tradition) food is not abundant, and mostly tubers (generally potato - often in a dehydrated form as *chuño* or *tunta*) are consumed, accompanied by a little cheese,

[10] In this thesis I engage with the data from the three communities together, merging them to build and corroborate my analysis. The only exception - though occasional - is Okola. In some sections and passages I deal with this community separately, due to the agro-tourism project that it hosts, which generates special circumstances and connections that deserve to be discussed individually. Otherwise, given the similarities among the three fieldwork sites, I considered it unnecessary to present the data disaggregated by community.

and sometimes eggs. People in Cachilaya are overall better off - they own more livestock and their meals are bigger and richer and often include lake fish. Okola is on average a rich rural community, given that favourable climatic and soil characteristics grant high land productivity and, most importantly, that activities like agro-tourism guarantee a constant generation of monetary earnings. In the last part of section 4.2.2 I explain what this initiative entails and what are its consequences for the community in terms of welfare and people's livelihoods. In 7.3 I discuss in greater detail the pros and cons of this project - which I analyse in connection with agrobiodiversity conservation and return migration. These two sections together provide a comprehensive picture of the relative prosperity enjoyed by Okola in comparison with the other communities.

The considerations above are drawn from my fieldnotes and from my conversations with local scientists[11] and farmers.

2.3 Indigenous smallholder farmers in the Altiplano Norte

2.3.1 Defining "indigenous", a controversial issue in a changing society

International organisations and financial institutions (i.e. IFAD 2002; Asian Development Bank 2002; Inter-American Development Bank 2006; World Bank 2005), as well as activists and scholars (Anaya 2004; Corntassel 2003) have formulated different policies on and definitions for "indigenous peoples"[12]. Although an official and universally recognised definition does not exist, some common elements can be identified by combining different sources. Indigenous peoples emerge as those who, through historical processes and while pursuing their own development, have maintained a distinct identity, tradition, language, worldview and lifestyle, as well as control over the lands, territories and natural resources, which sustain them and allow them to live as peoples (UNPFII 2008). Based on the different geographical and social contexts they live in, indeed, they reflect a great deal of diversity in culture, history and customs (IOM and UNPFII 2006).

[11] Scientists' observations were based on not only their personal experience, but also the results of some studies, conducted under the aegis of PROINPA, in which farmers' welfare status was measured according to participatory methods (see "*The controversial relation between agrobiodiversity and rural poverty*" - 3.2.3).

[12] In the ILO Convention 169 on Indigenous and Tribal Peoples (1989) the term "peoples" (plural) was used for the first time in international law, instead of "populations", to give recognition to group identity and collective rights (Danver 2012).

The working definition of indigenous peoples that currently benefits from the broadest international acceptance was given in 1986 by José Martínez Cobo, the Special Rapporteur of the UN Economic and Social Council Sub-Commission on Prevention of Discrimination and Protection of Minorities. In his "*Study on the Problem of Discrimination against Indigenous Populations*" (the "Martínez Cobo Study") he states: "Indigenous communities, peoples and nations are those which, having a historical continuity with pre-invasion and pre-colonial societies that developed on their territories, consider themselves distinct from other sectors of the societies now prevailing in those territories, or parts of them. They form at present non-dominant sectors of society and are determined to preserve, develop and transmit to future generations their ancestral territories, and their ethnic identity, as the basis of their continued existence as peoples, in accordance with their own cultural patterns, social institutions and legal systems" (Martínez Cobo 1986).

According to Martínez Cobo "historical continuity" is the "continuation, for an extended period reaching into the present of one or more of the following factors:

a) Occupation of ancestral lands, or at least of part of them;
b) Common ancestry with the original occupants of these lands;
c) Culture in general, or in specific manifestations (such as religion, living under a tribal system, membership of an indigenous community, dress, means of livelihood, lifestyle, etc.);
d) Language (whether used as the only language, as mother-tongue, as the habitual means of communication at home or in the family, or as the main, preferred, habitual, general or normal language);
e) Residence on certain parts of the country, or in certain regions of the world;
f) Other relevant factors".

His study introduces the principle of "self-determination" which is now one of the fundamental rights recognised by the United Nations Declaration on the Rights of Indigenous Peoples, adopted by the General Assembly in 2007 - the right for them to "freely determine their political status and freely pursue their economic, social and cultural development". Martínez Cobo affirms that "on an individual basis, an indigenous person is one who belongs to […] indigenous populations through self-identification as indigenous (group consciousness) and is recognized and accepted by these populations as one of its members (acceptance by the group). This preserves for these communities the sovereign right and power to decide who belongs to them, without external interference" (Martínez Cobo 1986).

While illustrating the controversial issues raised by this widely accepted definition falls beyond the scope of my work, I would like to emphasise how phenomena such as migration - so

common today among indigenous people in the Altiplano Norte and not only - pose serious challenges to it. To do this, I will exclusively focus on two aspects - both of them of particular relevance to my research.

1) Indigenous peoples are defined by Martínez Cobo as distinct and non-dominant components of society. They are sometimes indicated with reference to their little degree of participation in society and institutions (Asian Development Bank 2002). This aspect obviously varies from country to country. While in some places indigenous people live in separate communities or ethnic groupings that are geographically distant from urban centres, and operate on the outskirts of mainstream society, in others they have become increasingly integrated. It is common today to find people of indigenous origin in cities. This makes their identification as indigenous a complex issue. Two clarifications are necessary with reference to my research. The first one is that the Bolivian society is characterised by a strong indigenous component (2.2.1), which - after centuries of marginalisation - has recently seen an intense acceleration in the official recognition of its political and ethnic claims (2.3.2). Indigenous people are neither a minority, nor are they - at present - penalised by the government's activity[13]. The second one is that the "indigenous" identity is currently undergoing deep transformation, due to the growing overlap between rural and urban. In this thesis I discuss extensively how in the Altiplano Norte identities are being reshaped. In this region "indigeneity" is not lost because of migration, yet it is deeply altered and adapted to new conditions and stimuli. This makes the concept of "indigenous" difficult to encapsulate and bears multiple consequences in different spheres (social, political, legal). To give one example, in the 2012 National Census a large part of Bolivian rural migrants coming from indigenous communities did not self-declare as indigenous. Many depicted this as a major failure and a political defeat for the first indigenous president in the country's history (4.4 and 4.5).
2) The link between indigenous peoples' ethnic identity and ancestral territories and culture, highlighted by Martínez Cobo's definition, is emphasised and recalled in

[13] Although with the presidency of Evo Morales native peoples' issues have gained promincence in the government's agenda, not all indigenous groups in Bolivia feel equally represented and protected. While they all share the same history of oppression by the white and *mestizo* minority, today the challenges they face and the claims they advocate for are different (Fieldnotes 06-04-2013, meeting with ADA anthropologists). In particular, a disparity that often turns into conflict exists between Andean and Amazonian groups. It is rooted in a traditional rivarly between the people of the highlands and the people of the lowlands, and it is currently associated with the "colonisation" of the lowlands perpetrated by Andean people for natural resource extraction and exploitation. It is also linked with the scarce attention that the government has for Amazonian ethnicities, under-represented and forgotten by an indigenous president who neglects them in favour of "his people" - the Aymara and the Quechua (Lopez 2010).

numerous documents that underline, as anticipated in chapter 1, the important role of indigenous people's livelihoods in the stewardship of biodiversity. At the global level indigenous peoples are considered fundamental partners in the conservation of biodiversity, including agrobiodiversity (Sobrevila 2008). In the Bolivian Altiplano, the indigenous cosmovision - as proclaimed by organisations like CONAMAQ (National Council of Ayllus and Markas of Qullasuyu)[14] - values ancestral agriculture and products and promotes the conservation of agrobiodiversity (CONAMAQ 2014; COMPAS & AGRUCO 2001; Amend et al. 2008). Important knowledge concerning agriculture - it is stated - is transmitted generation after generation in indigenous communities, as part of a broader body of knowledge that is deeply linked with indigenous culture and lifestyle (Canqui & Morales 2009). This is indeed the case in the highlands' Aymara communities. However, as this thesis shows, due to migration, occurring within the framework of a broader social change process, indigenous people's lifestyle and needs - as well as their way of relating with land and crops and with agro-ecosystems in general - cannot be crystallised, or positioned with reference to identity as uncritically as such documents and declarations do.

2.3.2 Indigenous pride "reloaded"

The Americas constitute the "oldest and most dramatic example" of the treatment reserved to indigenous peoples, "slaughtered by invaders and their descendants since the conquest with drastic demographic consequences, under unique circumstances in the history of human kind" (Maybury-Lewis 2002). At the time of Discovery, the dominant conviction was that if "stronger and more advanced peoples" conquered and ruled over "weaker and backward ones", this fell under the natural order of things. Since the occupation of their territories, indigenous peoples were subjugated, or incorporated in alien states that regarded them as outsiders and often as inferiors (*Ibidem*). However, they sometimes "rose up in violent rebellion against the white and mestizo encroachments upon (their) lands" (Weismantel & Eisenman 1998, p.123), like they did in the 1780s in the Altiplano under the lead of Túpac Katari.

After independence in 1825, the Bolivian nation-state's relationship with indigenous communities was complex. On one hand, like in numerous other cases in the world, native

[14] CONAMQ was "reconstituted" in 1997 with the purpose of consolidating the ancestral territory of the big *Qullasuyu* under a cosmic vision that encompasses a specific administration system, a traditional management of natural resources, intra- and inter-cultural education, traditional medicine, ancestral agriculture, and traditional justice, according to indigenous knowledge (CONAMAQ 2014).

peoples were relegated to the margins of society and their issues seen "as problems of incorporation, integration, civilization and modernization" (Champagne, Torjesen, & Steiner 2005, p.1). In the name of development governments brought forward policies and values that were frequently in contrast with their identity and lifestyle (UNDP 2009). On the other hand, indigenous people often positioned themselves as opponents to the dominant components of society. In contemporary Bolivia such an attitude is still reflected in the activity of radical movements that claim the return to the pre-Hispanic past. The "*indianismo*" ideology, embraced by organisations like CONAMAQ, demands, for example, the conservation of ancestral roots and the revival of indigenous languages and costumes against Western education and "castellanisation" (expansion of the Castellano language and culture in spite of the pre-existence of indigenous languages and cultures), perceived as an attempt to eliminate indigenous diversity and homogenise culture (CONAMAQ 2014).

The creation of a Plurinational State was seen positively by those who felt oppressed within the previous uni-national state[15], emerged in Bolivia as the result of Spanish colonisation and subsequent independence (Zeballos Ibáñez 2011). Starting from 2005, when President Juan Evo Morales Ayma came into power, *campesino*, indigenous, and original peoples (*pueblos originarios*) of Bolivia have become the prime focus of the national government's political agenda and discourse.

After a campaign based on "increasing the rights of Bolivia's indigenous people, nationalizing the economy and protecting Bolivia's coca production" (Allen & Post 2014), Morales, a former *cocalero* (coca grower) and Aymara leader, was elected with one of the highest voter turnout rates in recent history (85%) (Healey 2009). Before this moment, the struggle of indigenous peoples had been based on class rather than ethnicity. At a time when indigenous farmers lived almost exclusively in rural areas, while *mestizo* and white people were urban dwellers, pro-Western governments, led by the white minority, had never addressed ethnic claims, and ethnicity had been "merely a component of class" (Bueno & Datta, 2011, p.6; see also Weismantel & Eisenman 1998). The conditions of chronic poverty and marginalisation, a decline in mining industry - which used to employ a lot of indigenous workers - and growing migration to cities altered, however, the rural-urban balance, giving rise to ethnic-based conflicts between the "two Bolivias" (Dunkerley 2007; Zeballos Ibáñez 2011). In addition, inequality (indigenous people could not own land, according to the 1967 Constitution, and

[15] As Wade (1997) argues, quoting Van der Berghe (1975) ethnicity - in that context - could be seen as "intimately linked with the unequal distribution of power and wealth", as well as with mechanisms of dependence and white domination (p.61).

were on average poor and destitute, if compared to non-indigenous citizens) and the neoliberal policies introduced by governments between the 1980s and the 1990s triggered a widespread dissatisfaction amongst indigenous citizens. The global ethnic revival and the shared feeling of oppression did the rest. Between the 1990s and the 2000s they stimulated "a sense of solidarity across diverse indigenous groups" (Bueno & Datta, 2011, p.8). In this framework, the rise of indigenous social movements - such as *Movimiento Al Socialismo* (MAS, Movement for Socialism), which quickly became Bolivia's most important political party (Nilsson 2013) - initiated a process of unification of the country's "politicized rural indigenous population" (Healey, 2009, p.85). This allowed Morales to win the elections, becoming the first indigenous president.

During his first two mandates[16], Evo Morales introduced significant changes aimed at equity (at the constitutional level, and consequently in the political and social spheres), distribution (through decentralisation) and welfare (with the nationalisation of important economic sectors, and the implementation of education and social welfare reforms - Balderrama Mariscal et al., 2011; Zeballos Ibáñez, 2011).

Within the framework of this thesis, the agrarian reform started by Morales deserves a mention. According to INRA, the National Agrarian Reform Institute, one third of all regularised land (surveyed and titled since 1996 under Bolivia's land regularisation laws) is now held collectively by indigenous and peasant organisations through the institution of the TIOCs, "*Territorios Indígenas Originarios Campesinos*", while 22% is owned privately by farmers in both the Eastern and the Western parts of the country. The possibility for indigenous municipalities to request the conversion into "*Autonomías Indígenas Originarios Campesinas*" or the recognition as "*Territorios Indígenas Originarios Campesinos*" have marked important milestones for Bolivia's rural indigenous peoples (IFAD 2011). Peasants and indigenous peoples currently own more than double the land they used to have in 1992 (INRA 2014; North American Congress on Latin America 2013).

Furthermore, the government of Morales, by exalting Bolivia's indigenous roots, implemented a new discourse that gives particular attention to the environment, in line with the Andean cosmovision that implies a strong connection between "*lo andino*" and nature[17]. This "agro-

[16] In 2013 a constitutional amendment allowed Morales to run for a third term. In October 2014 Morales was re-elected as president of Bolivia.

[17] Bolivian "cosmopolitics" can be considered as a clear example of the reunification between the natural and the human dimensions, typical of the Andean indigenous worldview. While Western political theory has traditionally excluded Earth-beings from the realm of politics - creating an artificial separation between Humanity and Nature -

ecologic vision" of the world (Lozada Pereira 2006) personifies Mother Earth (the *Pachamama*), considered a "living dynamic system made up of the undivided community of all living beings, who are all interconnected, interdependent and complementary, sharing a common destiny" (Article 3, Asamblea Legislativa Plurinacional de Bolivia, Ley de Derechos de la Madre Tierra, December 2010). With the approval of the first Law of the Rights of Mother Earth, the *Pachamama* was declared a "collective subject of public interest" (Article 5), life-systems were granted legal rights that ensure the protection of ecosystems and human beings who live in harmony with them[18]. In practice, this innovative stance with respect to nature has translated into 1) an increased emphasis, particularly in rhetoric and politics, on sustainable agriculture, agrobiodiversity conservation, *buen vivir* [19], and food sovereignty; 2) a legal framework that gives recognition to agrobiodiversity conservation for food sovereignty reasons, and that promotes an active role of public institutions in relevant initiatives (5.7.1); 3) a celebration of rural life and a revival of indigenous crops.

The Altiplano Norte and particularly the city of El Alto, largely populated by Aymara rural migrants, has emerged recently as "a key site for Bolivian politics" (Montesinos & Postero 2009, p.413). Across the whole region indigenous people from farming communities have become the protagonists of a real power shift, occurring in the Bolivian society, especially by virtue of migration that has fostered the formation of a grass-root indigenous movement based in urban areas. In spite of the rhetoric, which the government's discourse hinges on,

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Andean indigeneity rejects this antagonism and opts for a vision of politics in which nature is deeply embedded (De la Cadena 2010).

[18] The credibility of the government in this respect was shaken considerably by the conflict that begun in 2011 over the construction of a highway, connecting the Andes with the Amazon basin, through the Isoboro Sécure National Park and Indigenous Territory (TIPNIS). This area is a natural reserve, where endangered plant and animal species live, and it is home to the indigenous peoples Tsimanes, Yuracarés and Mojeño-Trinitarios (Friedman-Rudovsky 2012). The resolution of the government to implement this infrastructure project against the will of indigenous cultures and in favour of the interests of logging companies, *cocaleros* and extractive businesses triggered "a national political crisis and debate about the validity of the government's credentials as a progressive government that supports indigenous rights" (McNeish, 2013, p.221).

[19] The indigenous philosophy of *buen vivir* or *vivir bien* (*sumak kawsay* in Quechua, or *suma q'amaňa* in Aymara) is based on the principle of absolute harmony between human beings and nature, and on the acknowledgement, respect and protection of traditional indigenous practices. With its new Constitution the Plurinational State of Bolivia included this model among the ethical-moral founding principles of the State (Article 8) in open opposition with, and as an alternative to, the capitalistic and neo-liberal development paradigm (Chianese 2013). Bolivia, it is argued, rejects the Western ideals of individualism, dualism between humankind and nature, and linear progress based on material growth and adopts *buen vivir* with the intention to propose an alternative to capitalism (Wessendorf 2011) in an "ecological reorientation of Bolivia's economy and society" (Fabricant, 2012, p.193). Although it is important to highlight that discourse was radically reshaped with the introduction of such a paradigm, it is not my intention to romanticize the notion of "indigenous" and the reality in which indigenous people of Bolivia live. As this thesis shows, indigenous people's living conditions, livelihoods and identity, as well as their position within society and their relationship with nature reflect the ancestral principles in which they are rooted. However, structural dynamics and newly emerged priorities and challenges induce indigenous people to change these in line with self-interested strategies.

these people have modelled what Lazar calls a "third pathway" between indigenous collective traditions and a neoliberal subjectivity[20]. In El Alto, collectiveness resists the strong disenfranchising pressures it undergoes, thanks to its fluidity and deep penetration in society. However, it is possible to perceive a tension between collectiveness and individuality, between indigenous values and a market-oriented mentality, in different aspects of social life (Lazar 2008; Montesinos & Postero 2009). In the next chapters I discuss how this tension takes shape, and how it influences agrobiodiversity conservation, by explaining how farmers of the Lake Titicaca region engage with the new situations it generates.

2.3.3 "Smallholder farmers", "peasants", "subsistence farmers"

In this work I use the terms "smallholder farmers", "peasants" and "subsistence farmers" interchangeably to indicate the Aymara farmers of the Altiplano Norte. Drawing mainly from Bernstein (2010) and Hazell et al. (2007) it is possible to retrace their main features.

Bernstein points out that the characteristics 1) small size (below 2 hectares of land) and 2) low levels of technology are the criteria that are generally adopted for the identification of "small farms", managed by "smallholder farmers". Such parameters, though, cannot be universally tied to fixed values, because these vary from region to region. In addition, they refer to aspects that are not necessarily the most distinctive of small-scale farming (Hazell et al. 2007). In fact, other elements are crucial, and should be attached to the definition of "small-scale"/"smallholder" farmers. The first one is a tight link between production and consumption, which orients farmers towards a "subsistence" paradigm. The second one is the family dimension. Subsistence units are generally owned and managed by the members of a same household who themselves work in it (Bernstein 2010a; Van Der Ploeg 2008). In the Altiplano Norte farmers can be called "peasants", "smallholders" or "subsistence farmers" not only because of their small and largely non-mechanised farms, but also because of the "closed loop" type of agriculture that they practice.

As Bernstein clarifies, however, "not all farmers are farmers all the time" (Bernstein 2010a, p.3). Today, many of those who are commonly defined as peasants or subsistence farmers pursue diversified livelihoods, which include both farming and non-farming activities. The concept of "peasant" is shaken to its roots by livelihood diversification and migration. Further ahead in this thesis I analyse in detail how Altiplano Norte farmers relate to such phenomena. With the adoption of strategies inspired by capitalistic logics, subsistence producers

[20] I explain and discuss the emergence of the so-called *cholo-mestizo* mentality and lifestyle in 4.5.

increasingly opt for non-agricultural livelihoods in urban areas (Bernstein 2010a), or shift towards an entrepreneurial mode of farming (Van Der Ploeg 2008; Van Der Ploeg 1994). This is why the concept of "depeasantization" (Bryceson 2004) was elaborated, although some authors argue that "repeasantization" is also possible (Van Der Ploeg 2008). The outcomes of both processes and their connections with migration are extensively discussed in chapters 6 and 7.

2.4 Rural-urban migration

2.4.1 Migration beyond physical relocation

The International Organization for Migration defines migration as the "process of moving, either across an international border or within a State", consisting of a "population movement, encompassing any kind of movement of people, whatever its length, composition and causes" and including "migration of refugees, displaced persons, uprooted people, and economic migrants" (IOM 2004).

In this thesis I adopt a notion of migration that goes beyond considering the mere physical movement of people from a rural place of origin to an urban place of destination. Migration refers to a broader picture that includes, besides the physical relocation of voluntary migrants, a series of transformations underway in the Altiplano Norte. These are urbanisation, caused by the continuous flow of rural migrants to the cities of La Paz and El Alto; livelihood change and deagrarianisation, entailing an overall shift from farming to non-farming activities within rural households with a radical change of indigenous communities; formation of new spaces and identities through the movement of migrants, *in situ* urbanisation of the countryside, and ruralisation of tastes and preferences in the cities.

These processes are all linked with migration, which is, therefore, used in this work as a lens to obtain an accurate view of the current Altiplano Norte. While taking into account causes and consequences of migration in a narrow sense, this comprehensive perspective allows me to factor into my analysis important elements such as the growing interconnectedness and overlapping between rural and urban areas, the intense movement and exchange of people and goods, and the emergence of new realities. Exploring such aspects by departing from migration makes it possible to acquire new information that "unpacks" "rurality", and brings useful connections for understanding farmers' choices in agrobiodiversity conservation to light.

The next chapter outlines in more detail the theoretical tools I used to make sense of this complex picture.

2.4.2 Rural-urban migration in the Altiplano Norte

According to Heins, in Bolivia two recent historical events can be regarded as triggers of contemporary migration - the National Revolution of 1952 that prompted an agrarian reform and the beginning of industrialisation; and the economic crisis of 1985-1990, which forced many to move in search for a job (Heins 2011; see also Tapia Ladino 2010). While the first one should be considered as the original cause of internal rural-urban migration, the second primarily generated migration to other countries. Bolivians have migrated abroad since the 1950s - to Brazil, Chile and Argentina, especially between the 1960s and 1970s; to the United States, starting from the 1980s; to Europe, particularly to Spain, since the 2000s (Yarnall & Price 2010). In that decade international migrants mostly chose Europe rather than Latin American countries or the United States because of the economic crisis in Argentina and the restrictions introduced in the United States following the terrorist attacks of 9/11 (Nijenhuis 2010).

Although international migrants are often overqualified for the position they occupy and make less than their native colleagues, they gain access to considerable earnings compared to Bolivian standards (Nijenhuis 2010). Yet, the investment that is necessary in order to undertake migration is substantial. Rural farmers from the Altiplano Norte participate to international flows only very marginally, choosing - when they do - destinations in neighbouring South American countries (INE 2013; Fieldnotes August 2012). The destinations of Aymara migrants are mainly rural towns, and more often cities like La Paz and El Alto (Thomas & Wittick 1981; Eyzaguirre et al. 2004), or Cochabamba and Santa Cruz - the latter, though, an urban magnet mostly within the valley region (Andersen, 2002; Pérez-Crespo, 1991).

Migration has always been a widely chosen path in the Altiplano's rural areas - a "continuous and historical process" (translated from Tapia Ladino 2010, p.10). It has characterised this region since colonial times, when indigenous people were forced to relocate as slaves to mines or farms, or encouraged to move to the expanding cities by emerging employment opportunities (Heins 2011; 4.2.1). With the creation of the Bolivian independent state, compulsory work in the mines was abolished. However, the mining business experienced a

significant expansion at the beginning of the XIX century and silver and tin mines, particularly in the area of Potosí, begun to attract numerous workers. Besides the reactivation of the mines, new investments triggered the modernisation of industrial production - initially revolving exclusively around the mining sector, and later on embracing manufacturing for internal consumption. Manufacturing in Bolivia never took off as an important sector pulling the country's economy. This was due to both the predominance of the mining industry and the traditional reliance on international exchange, i.e. manufactured goods were mainly imported (Seoane Flores 2015).

This changed at the beginning of the XX century with the economic crisis; the First World War and the subsequent interruption of trade routes; and later on the nationalisation of the mines after the 1952 revolution. The subsequent decline of the mining business - as I explain in 4.2.2 in connection with the growth of El Alto - was responsible for a strong wave of migration towards the cities. Meanwhile, factories were being established in the urban Altiplano Norte (CEPAL 1958). As the assessment of the Plan Bohan[21] confirms, however, for structural reasons (i.e. the low competitiveness on the international market and the small size of the internal market) these did not and could not account for a significant portion of the country's GDP (Seoane Flores 2015).

Besides pull factors, push factors (Lee 1966) also deserve attention. In the Altiplano Norte, since the 1950s indigenous farmers were pushed away from their villages by low agricultural productivity, caused by harsh climatic conditions, soil erosion and land fragmentation, chronic food insecurity, poverty and vulnerability. Insufficient public investment, and poor infrastructure, education and health facilities completed the picture. Meanwhile, cities have been farmers' main aspiration since urban industry, services and commerce begun to offer attractive income opportunities (Urioste F. De C. 2003; Eyzaguirre et al. 2004; López Levy 2001; Pérez-Crespo 1991; Thornett 2009).

For many rural households migration is today part of the family strategy for the acquisition of additional resources and for income diversification purposes. It is, in other words, integrated in the indigenous farmers' way of living (De la Torre Ávila, 2009; Zimmerer, 1993), a "short-cut", "developed and sustained through the decades to better their lives" (Yarnall & Price 2010, p.121).

[21] As part of the United States' cooperation plan with their allies, the technical mission led by the economist Merwin Bohan produced a study in 1942, which was meant to be the basis for the United States' engagement strategy with Bolivia.

2.5 On-farm agrobiodiversity conservation

2.5.1 What is agrobiodiversity?

According to the Convention on Biological Diversity, biodiversity encompasses "the variability among living organisms from all sources […] and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (Article 2, *Convention on Biological Diversity* 1992). As Kontoleon et al. point out, this definition focuses on genetic diversity (the amount of genetic variability within species) and ecological diversity (the number of species in a community of organisms)" (Kontoleon et al. 2009, p.1)

Agrobiodiversity can be defined as "the variety and variability of animals, plants, and micro-organisms on earth that are important to food and agriculture which result from the interaction between the environment, genetic resources and the management systems and practices used by people" (FAO, 1999, p.5). In this definition the natural and the human components, which are strictly inter-connected in agro-ecosystems, are given equal emphasis. Furthermore, not only "genetic, species and agro-ecosystem diversity and the different ways land and water resources are used for production", but also "cultural diversity, which influences human interactions at all levels" are taken into consideration (*Ibidem*).

In this thesis I endorse this definition. However, I focus in particular on inter- and intra-specific agricultural diversity, conserved by smallholder producers in their farms, and on the relevant knowledge that is instrumental for the conservation of agrobiodiversity (5.3.1; 5.3.2).

2.5.2 Conserving agrobiodiversity

Agrobiodiversity conservation is performed *ex situ* or *in situ*.

- *In situ* conservation practices, implemented in the location where varieties are encountered and in traditional farming systems (in the case of on-farm conservation), maintain natural genetic interactions between crops, their wild relatives and the local environment (Malice & Baudoin 2009).
- *Ex situ* conservation, on the contrary, implies "the removal of germplasm from the place where it is found growing and storage off-site as seeds in a genebank, vegetative material in *in vitro* storage, or plant accessions growing in a botanical garden or field genebank" (Jarvis et al., 2000, p.7).

At present conservation and sustainable use of biodiversity for food and agriculture are usually supported by strategies including both *in situ* and *ex situ* conservation (Kontoleon et al. 2009b). Each method has advantages and disadvantages and an integrated approach, incorporating elements of both, is currently considered the most effective (Jarvis et al. 2000). On one hand, it is acknowledged that *ex situ* conservation needs "companion measures" and cannot be implemented in isolation (Pascual et al. 2011)[22]. On the other hand, *in situ* conservation requires the backing of *ex situ* when varieties are lost locally. Indeed, *ex situ* guarantees long-term secure storage and easy accessibility to germplasm for study and use.

While recognising the importance of *ex situ* practices, in this research I look at *in situ*/on-farm conservation. As I explain in 5.2, on-farm agrobiodiversity conservation entails a series of benefits for agro-ecosystems and for farmers (Jarvis et al. 2000). However, although their work generates important regional, national and global benefits, smallholders are often not rewarded for the service they provide and the private costs they face to perform conservation activities. On the contrary, market pressures and a low economic value associated with agrobiodiversity induce them to abandon neglected and underutilised crops and varieties. Furthermore, phenomena like out-migration from rural areas cause a shift away from farming and an overall agronomic simplification (chapter 6).

In order to encourage producers to keep up their conservation work, scientists have designed mechanisms that incentivise them, through direct rewards - either monetary on in-kind - or market chain development, to conserve and sustainably use agrobiodiverisity. Such mechanisms are subject to criticism because of their market basis and their structured and quantitative nature, which does not always suit the local realities where they are applied (Fuentes-George 2014). Nevertheless, today, in the framework of internationally funded programmes, mechanisms that retrace the Payment for Ecosystem Services (PES) scheme, are often implemented under the name PACS - Payment for Agrobiodiversity Conservation Services (PACS). These are a market-based solutions aiming at increasing private benefits for conservationist farmers (Narloch et al. 2009; FAO 2013b). Some of the initiatives analysed in chapter 7 fall *de facto* under PACS schemes.

In conclusion, when looking at on-farm agrobiodiversity conservation it is impossible to disregard what occurs around farmers. In fact, "diversity does not exist in a cultural, ecological,

[22] For example, through *in situ*/on-farm conservation it is possible to maintain those seeds that cannot be stored in genebanks. The so-called "recalcitrant" seeds, for instance, cannot be dried or frozen for conservation purposes and must be conserved on farm (Gruberg et al. 2013).

or economic vacuum" (Steinberg & Taylor, 2002, p.346). This thesis analyses how the "new rurality" in which Altiplano Norte farmers live shapes their knowledge and practices concerning agrobiodiversity.

3. Studying agrobiodiversity-migration connections. Theoretical framework and research methodology

3.1 Introduction

After illustrating the justification for my research in chapter 1, and introducing some essential empirical information in chapter 2, in this chapter I explain how I engaged with my central research question from both a theoretical and a methodological point of view.

Section 3.2 presents the theoretical framework for the study of the connections between agrobiodiversity conservation and migration in the Altiplano Norte of Bolivia. I firstly situate my work within the political ecology-inspired debate of society-nature co-construction, and clarify how an approach informed by agroecology contributes to my analysis of agro-ecosystems' transformation, taking place following not only environmental but also social change.

Then, I outline my approach to the study of migration, which is analysed from three different perspectives - micro, meso and macro - used both separately and jointly to make sense of the complex rural-urban migration scenario of the Altiplano Norte.

I point out that in Aymara communities a trend towards agronomic simplification linked with migration exists. It is possible to include it into a deagrarianisation picture, in which agrarian societies - in times of capitalism, due to market pressures - undergo a gradual shift away from farming and a pull towards urbanisation. However, documenting this transition only tells a part of the story. Indeed, a "new rurality", in which smallholders develop a new relationship with farming, takes shape in the countryside, as people increasingly rely on multiple - agricultural and non-agricultural - livelihoods. This, though, goes hand in hand with the emergence of a *desakota* region where rural and urban overlap. In this new physical and ideal space important changes occur, with an *in situ* urbanisation of Aymara communities, a ruralisation of tastes and preferences in La Paz and El Alto, and the formation of a *cholo-mestizo*[23] identity that draws from both indigenous lifestyle and traditions, and urban market-oriented mentality and values. Theoretical tools like "indigenous modernities" and "repeasantization" are of great help to understand what these transformations cause with reference to agrobiodiversity conservation and use, besides agronomic simplification. What happens in the Altiplano Norte, in fact, is not

[23] See 4.5.

exclusively limited to a loss of agricultural varieties and relevant knowledge. A process of agrobiodiversity "reinvention" is also fostered by current *desakota* opportunities and rural-urban interactions.

Section 3.3 presents my methodology. It explains the strategy I adopted for operationalizing my central research question; it clarifies which data collection techniques I employed in the field; finally, it discusses some limitations encountered during the fieldwork.

3.2 Theoretical framework

3.2.1 The society-nature interface

Agrobiodiversity, a co-product of society and nature

Both my approach to agrobiodiversity and the very idea of looking at the connections between its conservation and migration rely on assumptions inspired by political ecology.

1) Farming, including the specific case of agrobiodiversity conservation, is an expression of people's engagement with nature for their own sustenance and in function of their needs. These, in turn, are shaped by farmers' preferences and by their feasibility within the specific natural environment in which they live. In his study on irrigation in Latin America, Zimmerer states that "concrete expressions of the human environment interface such as irrigation are […] moulded by human-shaped biogeophysical factors and flows" (Zimmerer 2000, p.153), both directly and indirectly. The same applies to agricultural systems, which can also be thought of as "the product of *both* environmental and broadly social processes that include the making of cultural images" (*Ibidem*).
2) Farmers' choices in agrobiodiversity conservation and use are dictated by past and contingent environmental features and occurrences, socio-political phenomena, economic needs and priorities, and new identities, such as those taking shape today in the Altiplano Norte across rural and urban areas. The importance of basing agrobiodiversity conservation on "interdisciplinary research between biophysical and social sciences" (Jackson et al., 2007, p.205) is acknowledged by a number of studies (Malice & Baudoin 2009; Jackson et al. 2007; Steinberg & Taylor 2002; Altieri et al. 1987; Bellon 1996), whose claims further justify my research focus and emphasise how

> necessary it is to explore the complex combination of circumstances that determines on-farm agrobiodiversity conservation and use. As Malice and Baudoin argue, "crop diversity is not only the result of natural factors, such as mutation and natural selection, but also and particularly, of human selection and management; in the last instance, farmer's decisions define whether […] populations [of crops] are maintained or will disappear" (Malice & Baudoin, 2009, p.445). In virtue of the crucial role of farmers, it is essential to understand how transformations in society affect their choices. I insert, therefore, the study of agrobiodiversity conservation and use into a broader picture in which, in line with political ecology, natural, socio-economic and political occurrences are taken into equal consideration, and their mutual influences analysed.

Consistent with this view, my work incorporates the underlying idea that society and nature are co-constructed (Robbins 2012). Its relevance to my research is given, for example, by the observation that today in the Altiplano Norte farmers' consideration for agrobiodiversity is shaped by the on-going transformation of their identities, needs, and aspirations. These elements are affected by migration in the broad sense, by the current socio-political context, by the challenges and opportunities emerging across rural and urban areas that determine a new perception of agricultural varieties' conservation and use in farmers' communities.
Producers' choices concerning agrobiodiversity are determined by an intricate web of relations. In order to build an effective framework, therefore, it is not enough to rely exclusively on the society-nature co-construction principle. This provides a basis that requires the use of other theoretical tools explaining *how* society and nature are connected with each other, and how the different elements that compose the complex agrobiodiversity-migration picture come into play.

Exploring agro-ecosystems through agroecology

For the study of agro-ecosystems I combine political ecology with an agroecology-inspired perspective. Agroecology analyses agro-ecosystems through an integrative approach that encompasses the ecological, economic and social dimensions (Francis et al., 2003, p.100). As Altieri reminds us, scientists have, for a long time, maintained a "one-dimensional view of agroecosystems" (Altieri, 2000, p.2), looking exclusively at their genetic and agronomic characteristics. Only recently they have broadened their focus to embrace "an understanding

of ecological and social levels of co-evolution, structure and function" (*Ibidem*). This is particularly important in the study of on-farm agrobiodiversity conservation.

Political ecology conceives ecological systems as political, and our notion of them as "further delimited and directed through political and economic processes" (Robbins 2012, p.20). By relying on agroecology in connection with political ecology it is possible to challenge a uni-dimensional and apolitical view of the society-nature interface and, in particular, of agro-ecosystems. Such an endeavour is in line with a dominant conviction amongst the advocates of agroecology, according to which we need to "study, design and manage agroecosystems that are both productive and natural resource conserving, and […] culturally sensitive, socially just and economically viable" (Gliessman 2007, p.2). This is crucial to reverse the unsustainable turn that the global food production system has taken recently by promoting "large-scale commodity-oriented farming" (p.14) and imposing capitalistic agriculture and a production model based on expensive technology and low food prices.

Within this picture the agroecology narrative expresses concern for agrobiodiversity loss and, overall, for the replacement of diversity-based and environmentally sustainable cropping systems with competitive export-oriented agricultural sectors, based on productivity maximization and monocultures (Altieri 2009; Rosset 2006). While I share this concern, which has largely motivated my dedication to agrobiodiversity-related issues and my interest in the topic of this thesis, the main contribution to this work that I draw from agroecology is on a different front, and can be summarized as follows:

1) Agroecology, by resting on political ecology, promotes a holistic study of agro-ecosystems, including both environmental and human elements (Francis et al., 2003). Such an approach is crucial for understanding the dynamics associated with agrobiodiversity conservation and use in small-scale indigenous farms. I adopt it to grasp the connections between migration and these practices in the Altiplano Norte.
2) Agroecology emphasises the importance of taking multiple scales into account: a) the plot and field scales; b) the agro-ecosystem and farm scales; c) the broader food system. These three dimensions are inter-connected. Although historically each of them has emerged in the literature in relation to a specific approach to agroecology, today they are frequently merged and considered together for a comprehensive study of agro-ecosystems (Wezel et al. 2009). Paying attention to these different levels of analysis is crucial for identifying connections within and across them, particularly when a phenomenon like on-farm agrobiodiversity conservation is put in connection with one like migration. In the Altiplano Norte context, agrobiodiversity conservation pertains to a local and small-scale dimension; migration, instead, entails movement,

and brings together through migrants different realities within and beyond rural communities. Through agroecology it is possible to combine - in the study of agro-ecosystems - physical and ideal spaces across rural and urban areas.

3.2.2 Analysing rural-urban migration

Section 2.4 explained that the definition of migration adopted in this work is not limited to people's movement from rural to urban areas, but extends to analytically embrace phenomena linked with rural-urban migration in the strict sense that are particularly relevant to the Altiplano Norte context. These include livelihood change, deagrarianisation, and the growing overlap between countryside and city.

Other departure points could have been selected instead of migration for an analysis of the connections between on-farm agrobiodiversity conservation and the socio-economic and political changes underway in the Bolivian Highlands. The choice of migration is based on 1) the acknowledgement that the rural-urban movement of smallholder farmers as temporary or permanent migrants has acquired massive proportions in the Lake Titicaca region, and is linked with a series of other phenomena that reshape society and rural and urban identities (4.2); and 2) my personal interest in indigenous people's migration, in line with my expertise and previous work.

It might be argued that a more effective contribution to research on on-farm agrobiodiversity could have come from adopting an even broader perspective that removes migration from the privileged analytical position that I assign to it, and looks at what overall affects farmers' choices in the globalised world: *inter alia*, market development, political events, national or sub-national laws and regulations, climate change etc.[24]. Although desirable in principle, a study of this kind is too complex and large in scope to be carried out satisfactorily within the framework of a PhD project. Choosing a specific cut, by focusing on a phenomenon to take into consideration in relation to agrobiodiversity conservation, was necessary for reasons of feasibility and detail. Furthermore, departing from rural-urban migration offers an innovative contribution to the research carried out so far in the Bolivian Altiplano Norte, as emphasised in chapter 1.

[24] Zimmerer's contribution is particularly noteworthy in this respect, with reference to the Andean region (2014; 2013; 2010; 1996). His book "*Changing Fortunes. Biodiversity and Peasant Livelihood in the Peruvian Andes*", dated 1997, offers an exceptionally comprehensive overview of agrobiodiversity conservation in contemporary Peru. A specific focus/"entry point" (different from migration) is chosen in his other studies on the Andes (i.e. agricultural intensification - Zimmerer 2013; irrigation - Zimmerer 2011).

To explore the connections between on-farm agrobiodiversity conservation and rural-urban migration I take into consideration what forms part of the "broader picture", and influences both elements and the linkages between them. I engage with "migration" by merging three different levels of analysis, according to an "integrative approach" (Oishi 2002).

1) I look at the individual and household level (micro level), by exploring families' strategies and farmers' rational and self-interested decision-making concerning livelihoods and migration, along the lines of Lee, and Harris and Todaro. These authors conceive of migration as the result of push and pull factors (Lee 1966), and of calculations based on expected wage and lifestyle differentials between places of origin and destination (Harris & Todaro, 1970). They assign a fundamental role to human agency.
2) I take into consideration social networks emerging across places of origin and places of destination (meso level). Indigenous migrants - the "edgewalkers" (Tupuola, 2007) - bridge the gap between rural and urban. They are important intermediaries and vehicles of transmission of resources, ideas and habits. In the Altiplano Norte indigenous people's urbanisation has generated new identities that - as Lazar argues with reference to El Alto - bring together Andean traditions, indigenous political awareness, and a strong sense of urban/local identity (Lazar 2008; Montesinos & Postero 2009).
3) I include into the picture large-scale structural dynamics, taking shape in Bolivia, just like in other developing countries (macro level). Migration is often perceived as an inevitable occurrence within the framework of economic development, as in Ravenstein (1885; 1889) - the "father of modern migration studies" (Skeldon 2008) - who asserts that migration is positively related to development and that in developing countries these two elements increase simultaneously. More recent publications consider migration as the "natural consequence of economic globalisation" (Massey et al., 2011). Furthermore, with specific reference to rural-urban migration, a whole strand of literature includes it within the framework of agrarian change (as I critically discuss in the next section).

In the Northern Highlands the phenomena of out-migration from rural communities and livelihood transformation, and the gradual shift away from subsistence agriculture are indeed the result of "propelling forces" (Rigg 2006). As Bakewell et al. (2012) argue, however, social change cannot be explained by relying exclusively on structural dynamics. On the contrary, it is necessary to use agency, social relations and networks to understand their origin, perpetration

and transformation, as well as their qualities. Migration and mobility in the Altiplano Norte are not exclusively the outcome of individual action. However, though responding to some structural trends, they are strongly shaped by decisions taken at the family level and based on the availability of opportunities, the exchange of information, and migrants' networks operating within and beyond Bolivia's borders. All three levels of analysis, therefore, are important. In this work I deal with them both separately and in combination.

In this thesis I do not restrict my focus to a specific type of migration. Different patterns - in terms of both destination and timing - are included in my analysis. All cases observed in the research area are discussed (rural-urban/internal, rural-rural/internal, international; temporary/seasonal, permanent, return). In developing countries, however, out-migration from rural areas manifests with a movement of people within national borders more often than with international migration (Chiswick & Hatton 2003), and the Altiplano Norte is no exception. Because voluntary internal rural-urban migration is the most frequent pattern there, most of the analysis presented in this thesis concerns this type of migration, and some of the theoretical tools discussed below directly refer to it.

3.2.3 Migration and agronomic simplification as part of the same picture

Agronomic simplification in the framework of agrarian change

The phenomenon of rural-urban migration can be read through the lens of agrarian change. The literature considers it as part of the transition from subsistence farming to capitalism, occurring in all countries that pursue development. Through this shift a "closed-loop agricultural system" that uses "green" and locally sourced inputs is gradually abandoned by farmers in favour of either an urban life and non-agricultural employment in sectors dominated by unbalanced power relations, or the integration into "agriculture" (Bernstein 2010a). "Agriculture" is understood here as a sector of the economy characterised by the same paradigms and forces - division of labour, technology, market dynamics - that are typical of capitalism. It does not only include farming, but also all the activities "upstream" and "downstream" of it, alongside technological innovation for productivity increase. Today in the Global South, small farmers - it is argued - are increasingly pushed to abandon their land and livelihoods, and to migrate to cities in search of a monetary income and better living conditions (Start 2001). They either find a job in the city, often joining the ranks of the urban

poor, or get incorporated into low-wage labour for export agriculture (Rosset 2006). In this scenario agrobiodiversity is penalised in favour of high yields.

Looking at the connections between agrobiodiversity conservation and migration exclusively from the point of view of this shift is quite constraining. Firstly, doing so implies taking a point of departure as reference (subsistence farming), and outlining a post-transition scenario as the final stage (a world in which subsistence farming and on-farm agrobiodiversity no longer exist). Within this framework the struggle currently brought forward by numerous activists, scientists, international organisations and farmers in order to avoid genetic erosion in agriculture is reduced to a mere form of resistance in the face of an inevitable transformation.

Secondly, this framework does not allow enough space to capture the complexity of the current Altiplano Norte. By echoing Marx, the literature identifies in the social division of labour between agriculture and industry and between countryside and town one of the main features of capitalism (Bernstein 2010b; Bernstein 2010a; Bryceson 2000). Livelihoods and spaces are tightly clustered into fixed categories, which are not adequate for exploring the fluid relationship between rural and urban (Ellis & Harris 2004) that is typical of today's Altiplano Norte, and for understanding the formation of new identities that do not belong to either one of these realms. A binary vision, as Robins argues, "obscure[s] the complex realities of the culturally hybrid responses" that indigenous farmers develop when they are confronted with new challenges (Robins, 2003, p.267). In 3.2.4 I elaborate on indigenous responses to change further.

Thirdly, *connections* (chapter 1; 3.3.1) cannot be adequately analysed if the link between countryside and city, and between farming and other livelihoods, is only seen in function of a gradual shift towards a capitalist system. Doing so entails an intrinsic bias towards a given type of connection, based on a causal relation that perceives a) migration as responsible for the abandonment of agriculture and agronomic simplification in rural areas; b) migration towards urban areas and agrobiodiversity conservation as mutually exclusive. If taken to the extreme, such a position can lead to a "strong moral preference for village life and rural pursuits", as if it was to be taken for granted that "rural people *should* remain in the countryside and in farming" (Rigg, 2006, p.187) to keep agrobiodiversity from disappearing completely.

Fourthly, within this perspective farmers' agency is downplayed, as rural migrants appear fundamentally passive in the face of structural dynamics. Farmers, instead, engage, in a process of dialogue and negotiation with change (Yaro 2006). They do not only resist it by defending a static position, but they protect themselves and adapt to it by responding strategically to new circumstances.

The controversial relation between agrobiodiversity and rural poverty

Agrobiodiversity conservation is a possible strategy to tackle rural poverty. In their study "*Mobilizing neglected and underutilized crops to strengthen food security and alleviate poverty in India*" Ravi et al. state that conserving and consuming neglected and underutilised crops, which have "high adaptive advantages under marginal agro-ecological […] situations", is instrumental to enhancing the food and nutritional security of rural communities. It strengthens the traditional food culture; it provides farmers with an important means to respond to climate change; and, ultimately, it improves farmers' income (Ravi et al. 2012, p.115). This argument - widely shared and demonstrated by a number of best practices around the world (PAR & FAO 2011; Sthapit et al. 2006; Pascual et al. 2011; Clawson 1990; PAR 2010) - is at the basis of numerous international organisations' programmes and of NGOs' activities in the Altiplano Norte and in other developing countries' regions (Bioversity International 2012; Padulosi et al. 2011; Rojas et al. 2010; Jarvis et al. 2000). The relationship between agrobiodiversity and poverty, however, is not unidirectional (Kontoleon et al. 2009a). On the contrary, it is extremely complex, especially when elements like rural-urban migration, livelihood diversification, and market participation are included into the picture.

Part of the literature considers agrobiodiversity conservation as necessarily related to a condition of isolation and poverty, afflicting conservationist farmers (Vira & Kontoleon 2010). When households increase their wealth - it is argued - people devote less time and resources to the conservation of agrobiodiversity and concentrate their efforts on other activities (Jodha 1995; Cavendish 2000; Cavendish 1999). Agrobiodiversity is reduced or even lost when smallholders privilege modern varieties and shift resource use away from it; when they diversify their livelihoods and strengthen their connections with the market; and when - by choosing migration - they start working outside agriculture to increase their income. Decisions and behaviours that put agrobiodiversity at risk often derive from the application of international or government rural development strategies, which focus, among other things, on reducing rural poverty by intensifying agricultural production, producing high value crops, enhancing opportunities in non-farm activities, and promoting market integration of households through improved rural infrastructure (Wood & Lenne 1997; Winters et al. 2006).

The role of markets in agrobiodiversity conservation is a debated issue. The connection that smallholder producers establish with the market can affect their propensity and capacity to

conserve and use agrobiodiversity. Market forces tend to penalise minor crop varieties, and to favour mainstream high-yielding ones. Although smallholder farmers have preserved crop varieties and relevant knowledge until today because of a number of benefits they can draw from their use, nowadays incentives are often lacking for conservationist farmers, who constantly deal with new socio-economic challenges and transformations, occurring primarily as part of a market economy transition in developing countries (Pascual et al. 2011; Bellon 1996). Current markets and institutions can create strong incentives for farmers to "disinvest" in agrobiodiversity as an asset (Pascual & Perrings 2007).

The consequences of farmers' participation in the market, however, are not so linear. On the contrary, they are multi-directional, and - as some report - have not yet been articulated properly (Velásquez-Milla et al. 2011; Kontoleon et al. 2009b). Prabhu Pingali - in his foreword to the book "*Agrobiodiversity conservation and economic development*" by Kontoleon et al. - states that "agricultural biodiversity management involves necessary trade-offs with human aspirations for improved food security and improved livelihoods". The same mechanisms and tools used for wild diversity conservation are not applicable to a framework in which farmers' families actively preserve agricultural varieties by implementing specific practices that year after year grant their own sustenance, as well as the survival of genetic diversity (Kontoleon et al. 2009, p. xxi). Living conditions' improvement and development are crucial stimuli for conservation in rural communities. They motivate governments, international organisations, and NGOs to action, and - most importantly - they incentivise the farmers themselves. Market-like mechanisms for agrobiodiversity conservation can encourage farmers to continue their conservation efforts (Pascual & Perrings 2007; Narloch et al. 2009; Pascual et al. 2011). Therefore, payment or reward for providing an important ecosystem service have been introduced in poor rural areas with the aim to ensure that the protagonists of on-farm conservation are adequately compensated for what they do, and enjoy a condition of improved wellbeing.

Using the market to foster poor smallholder farmers' conservation activities, though, can bring about the risk of unleashing forces that end up marginalising minor underutilised crops (Marglin 2000; Gowdy 1997; Zimmerer 2013). As Kontoleon et al. state, the "direction of causality" in the relationship between on-farm conservation and producers' participation to the market is unclear: "Is on-farm conservation of agrobiodiversity merely a consequence of having been left out of markets?", or "can markets develop in such a way that agrobiodiversity is supported?" (Kontoleon et al. 2009b, p.5). Generalisations are impossible, given the context-specific nature of the problem. Indeed, it is an arduous challenge to "develop agriculture to

improve food security and reduce poverty while at the same time protecting agricultural biodiversity" (Pingali in Kontoleon et al. 2009, p. xxii).

Relying on the preliminary assumption that market participation, and income generation through livelihood diversification and migration are incompatible with on-farm agrobiodiversity conservation in rural communities is counterproductive for the following reasons.

Firstly, it precludes the possibility of exploring the nature of farmers' involvement in these phenomena, and the characteristics of their complex relationship with urban and market realities. The market, for example, generates multi-directional connections, and - as Bellon argues - "crop diversity is not necessarily or completely replaced by market integration and the availability of new technologies" (Bellon 1996, p.31). Farmers can not only resist pressures in favour of agronomic simplification, but also draw from the market new incentives for agrobiodiversity conservation, as I explain below (3.2.4), and empirically show in chapter 7.

Secondly, it leads to the conclusion that conservation unavoidably condemns farmers to low living standards - "an argument that has been made to reject in situ conservation by the early planners of the international system of germplasm conservation" (Bellon 1996, p.31) - which is not the case in numerous instances, as evidence demonstrates. In the Lake Titicaca region, for example, families characterised by different welfare and livelihood conditions maintain broad seed diversity, as the following data - retrieved through the archival research I conducted in Bolivia - show.

1) By using participatory methods, Mamani Alvarez estimated the welfare status of a sample group of families in the community Cariquina Grande, Mocomoco municipality, to compare it with their propensity to conserve agrobiodiversity[25]. His study shows that in this village conservationist farmers owning more than 100 seed varieties (15% of the total) have an intermediate welfare status and are encouraged to keep a broad agricultural diversity by factors, like the possibility to participate to agrobiodiversity fairs[26], which are not directly linked with their welfare situation. There are some very poor farmers (15%), mostly elderly people, who conserve a high number of agricultural varieties (between 76 and 100). However, while the majority of farmers maintains an

[25] In the Altiplano Norte some scientists have elaborated a definition of welfare by working with the farmers of their target communities. They relied greatly on the principles of the "livelihood approach", widely applied in the appraisal of rural development since the 1990s (Baumann 2002; Fieldnotes - Workshop held by Dr. Edson Gandarillas in PROINPA's offices in La Paz on 25 September 2012).

[26] In chapter 5 I clarify what agrobiodiversity fairs consist of exactly.

intermediate welfare status and conserves between 25 and 50 varieties, *residentes*[27] - richer than the farmers who did not migrate - are the least prone to conserving agricultural diversity (they own below 25 seed varieties) and do not know any other use for it than consumption as food (Mamani Alvarez 2011).

2) According to Alarcon Vicente, the families of Coromata conserving most diversity are characterised by an intermediate to low welfare status. Amongst them there are families in which the main livelihood is not agriculture: heads of household are teachers, construction workers and carpenters (Alarcon Vicente 2011).
3) In Okola the highest concentration of genetic diversity can be found in the plots of families characterised by a high and intermediate welfare level. The heads of most households are middle-aged farmers, but poorer families with elderly components also show a marked propensity for agrobiodiversity conservation (IFAD, Bioversity International and Fundación PROINPA 2008).

Farmers' inclination to conserve agrobiodiversity cannot be unquestionably linked with a condition of poverty and isolation. At the same time, welfare and multiple livelihoods cannot be considered as responsible on their own for agronomic simplification. On the contrary, a wide range of different elements comes into play in shaping the relationship of farmers with agrobiodiversity. For example Mamani Alvarez (2011) identifies other important variables besides welfare that play a role in agrobiodiversity conservation at the household level - i.e. the composition of the household, farmers' education, their participation in NGOs' initiatives, their tendency to substitute native varieties with improved high-yielding seeds, etc.

Chapter 6 focuses on agrobiodiversity loss and identifies a series of factors, which, in the Altiplano Norte, determine it. However, the arguments and evidence that are presented must be regarded as just one part of the whole analysis, which chapter 7 completes, by looking at agrobiodiversity "reinvention".

Deagrarianisation and livelihood diversification

The discussion above suggests that, indeed, migration is connected with agrobiodiversity through mechanisms that generate a loss of agricultural varieties. Several authors point out that in most developing countries a broad transformation involving rural areas, people and livelihoods is occurring (Rigg 2006; Rigg et al. 2008; Bryceson 1997; Kay 2008; Van Der Ploeg

[27] *Residentes* are the urban migrants who maintain their residency in their community of origin, as well as their house and land. *Residentes* generally keep a strong connection with their family and village.

1994; De Grammont 2008). The Northern Highlands region of Bolivia is no exception. This process can be called "deagrarianisation", as it leads to a depopulation of the countryside, an abandonment of agriculture and an increasing urbanisation of people and activities with a balance shift from the rural to the urban (Bryceson 1997; Bryceson 2000). It encompasses the processes of "occupational adjustment, income-earning reorientation, social identification and spatial relocation of rural dwellers away from strictly agricultural-based modes of livelihood" (Bryceson 2004, p.617-618). It often goes hand in hand with depeasantisation, a phenomenon that, according to Bryceson, describes a situation in which the economic capacity and social coherence of peasantries is undermined, and peasant communities are unravelled by neoliberal forces.

A broad range of connections takes shape within this framework. Firstly, due to migration less people live in rural areas and work in agriculture. This challenges collective decision-making in indigenous villages, and the performance of a shared custodianship of agrobiodiversity at the family and community level. New generations of farmers, in particular, abandon their place of origin as teenagers, and opt for a future in the city. In spite of their upbringing as farmers, they do not conserve and transmit to their children seeds, knowledge and practices connected with agrobiodiversity. Their interests and aspirations - as well as their children's - are entirely focused on urban activities and goals.

Secondly, not only because of depopulation but also due to livelihood transformation in rural communities, subsistence farming is in decline. Permanent migrants living and working in the city, while maintaining land and crops in their places of origin, are the most extreme example of this case. *Residentes* generally put in practice simplifying choices in their fields, as they regard farming as a secondary occupation, which they are not willing to devote too much of their time and resources to. In addition, they rely on risk management strategies based on their urban activities. In their eyes agrobiodiversity is not an important asset, but a superfluous burden. In line with the *cholo-mestizo* mentality that influences and shapes the decisions of rural people, today many non-migrant smallholders also attribute more value to productivity, technical knowledge and income generation than to the preservation and the use of agricultural diversity. While the market acquires more weight in their routine, their food consumption patterns change, and some native crops - although elevated in mainstream discourse by a celebrative rhetoric - are marginalised in actual eating habits.

As it is evident from this preliminary presentation of empirical findings, deagrarianisation and livelihood diversification are useful theoretical tools to analyse what is happening in the Altiplano Norte. However, in this specific context, additional bodies of literature - like those

concerning "new rurality", *in situ* urbanisation and *desakota* regions - must be mobilised in support of those privileging a uni-linear transition perspective.

In situ urbanisation, new rurality and desakota to understand the Altiplano Norte's rural-urban overlap

Several authors acknowledge that, with reference to Latin America, the rural-urban dichotomy is no longer relevant today, because the relationship between rural and urban spaces, lifestyle and people is much more complex and undefined than it used to be (Lazar 2008; Pérez et al. 2008; De Grammont 2008; Arbona & Kohl 2004). This is a consequence of the globalisation of capital, the shift to a neoliberal development policy in the entire region, and the growing interconnectedness between rural and urban areas due to improved transportation, communication and technology (De Grammont 2008). Indeed, in the Bolivian Highlands the deagrarianisation trend that is in place does not correspond to a simple shift of human and economic resources from rural to urban areas. Exchange between them is intense and boundaries are undefined.

Both rural and urban areas are involved in a radical transformation. In a setting like the Altiplano Norte and in general in deagrarianisation situations, typically urban non-agricultural livelihoods are no longer exclusive to urban areas. Rural households tend to diversify their income-generating activities, which increasingly become non-farm, due to migration and *in situ* urbanisation (Zhu 1999). In addition, urban areas - not immune to this process - also undergo substantive change with an expansion of residential areas, the transformation of entire neighbourhoods due to the settlement of rural migrants, and the affirmation in the urban context of a new indigenous, yet urban, economic structure and lifestyle. In the Northern Altiplano the so-called *cholo-mestizo* mentality and way of living (Tassi 2010) has taken over entire areas and segments of the urban population (4.5). Furthermore, the rural and the urban dimensions can no longer be considered as two distinct poles, which are geographically defined and face different development challenges. In both rural and urban spaces the typical characteristics of "rural-ness" and "urban-ness" increasingly overlap, as the boundaries between them have become blurry and the space that connects them more important (Rigg 2006; De Grammont 2008; Rigg et al. 2008).

The concept of "new rurality" (De Grammont 2008) is useful to describe rural-urban relations areas like the Altiplano Norte. Rural-urban migration is a fundamental element in this scenario (Kay 2008). Nevertheless, it does not indicate a unidirectional flow, but a continuous

reconfiguration of rural and urban categories, caused by mutual influences and livelihood diversification at the individual, household and community level.

When cities grow in size and population, transportation connections, communications and exchange become more intense, urban activities spread into rural areas, and *desakota* regions emerge (The Desakota Study Team 2008; Hyman et al. 2000). The term *desakota*, coined joining the two Indonesian words *desa* (village) and *kota* (town), was created to indicate the most peripheral areas of mega-urban regions in Southeast Asia, which used to be rural but now gravitate increasingly towards the urban core (McGee 1991; 2009). Initially developed for another continent (Moench & Gyawali 2008; The Desakota Study Team 2008; McGee 2009), it can be applied to Latin America as well (Hyman et al. 2000), in spite of some important differences between the Andean region and the Asian countries where *desakota* instances were first identified. Economic growth in Latin America over the last decades has been more measured than in Asia; in addition, it has focused on agro-industries and services, rather than on manufacturing. Such occurrences make urbanisation and the formation of *desakota* regions take different forms in different contexts.

In Asia the regions with *desakota* potential are characterised by "densely populated small-holder agriculture", "large cities or clusters of cities", and "well-developed infrastructure of roads and canals that creates a highly integrated «transactive environment», facilitating the movement of people and commodities" (McGee 2009, p.11). In the Altiplano Norte similar features can be identified. The urban area La Paz-El Alto is expanding, extending physically to include Altiplano rural communities; indigenous farmers are increasingly mobile within an area of intense exchange of people, goods and information; transportation and communication connections are easy and frequent; opportunities are available in urban areas, encouraging rural people to migrate. The concept of *desakota* is useful to describe the present configuration of the Altiplano Norte, where - although on a smaller scale than the Asian metropolitan regions, and with typically Andean specificities - it is possible to observe the same dynamism of other complex realities that emerged following recent transformations. Chapter 4 shows how La Paz, the young indigenous city of El Alto and the adjacent Altiplano region present several *desakota* characteristics. El Alto is mostly populated by Aymara migrants, who are urban dwellers but keep strong connections with their communities of origin in rural areas. The countryside surrounding La Paz and El Alto is increasingly tied with urban areas, and indigenous migrants are the main intermediaries between the rural and the urban worlds.

3.2.4 The reinvention of agrobiodiversity through "repeasantization" and "indigenous modernities"

In the Altiplano Norte, in spite of the transformations underway in both rural and urban areas, agronomic simplification is not the only trend that is in place. Farmers who conserve a broad range of seeds still exist in indigenous communities. Furthermore, new stimuli encouraging them to maintain this diversity have emerged recently following farmers' increased participation in the market, and the activity of local and international organisations and of the government. A process of rediscovery and revival of agricultural genetic richness - fostered by *desakota* connections and opportunities, and by producers' choices - has taken shape within the same "new rurality" framework in which the opposite one can be observed.

In the Northern Highlands the phenomena of indigenous smallholders' rural-urban migration and *in situ* urbanisation in Aymara communities embed a series of mechanisms that foster the continuation of conservation activities and the revival of native crops. These contribute to a "reinvention of agrobiodiversity". This expression intends to describe a process whereby the on-farm maintenance of a wide portfolio of agricultural varietiesis not only granted as the perpetuation of a traditional practice, but also promoted and rediscovered with the attribution of new values to it[28].

Farmers' response to structural challenges

Bebbington, Van der Ploeg and Robins discuss in their work the changes that occur in the rural world 1) as part of globalisation (Bebbington); 2) as a reaction to the dynamics generated by the global economic and, particularly, agri-food system - "the Empire" (Van der Ploeg); 3) as a way to cope with mainstream development interventions at the local level (Robins). All three highlight the complexity of farmers' and indigenous peoples' responses when they are faced with challenges that put their livelihoods and lifestyle to the test. The peasantry has traditionally been viewed as static and non-modern, and the role of their agency has often been erroneously underestimated (Van Der Ploeg 2008). As Bebbington argues, although "crisis narratives" have generally prevailed - forewarning "the demise of rural livelihoods, the destruction of rural environments and the disempowerment of rural communities in the face

[28] I borrow the term "reinvention" from Zimmerer. In his 1996 book he applies this concept to customs, food and also crops (Zimmerer 1996). "Reinvention" is a "selective adoption and alteration […] of historical customs and traditions of resource use" (Zimmerer 2000, p.153), "a conspicuous feature of 'local-global' processes" relevant to cultural matters but also to human-environment relations (p.154).

of global integration" (Bebbington 2001, p.431) - these cannot be viewed as inevitable and uni-directional outcomes, as much as they describe frequent consequences of globalisation-related transformations. Peasant communities, although indeed challenged and affected by them, are not as fragile as it is often believed. In the Altiplano Norte, for example, what has happened in the last decades does not correspond to the first and only transformation caused by the rapid incursion of global forces in this region. On the contrary, indigenous agro-food systems have survived several revolutions, and have been conserved until the present day in spite of the pressures generated throughout the centuries by the introduction of non-native crops and commercial agriculture (Zimmerer 1996).

To indicate the "new forms of resistance, struggle and response" (Van Der Ploeg 2008, p.262) that characterise the way in which farmers relate to "the Empire" today, Van der Ploeg introduced the phrase "new peasantries". These are not necessarily overt reactions, such as protests or demonstrations, but, more often, they are expressed through "a wide range of heterogeneous and increasingly interlinked practices", a "multitude of responses" through which resistance is articulated (p.265), based on peasants' agency. Unlike other authors dealing with deagrarianisation (Bryceson et al. 2000; Bernstein 1977; Bernstein 1986), pluriactivity, instead of being viewed "as just another (and probably definitive) stage in the disappearance of peasantry" (Van Der Ploeg 2008, p.33), is discussed by Van der Ploeg as a strategy that can change and improve farming. Migration and livelihood diversification, resulting in an increased interaction with urban dwellers and intensified market participation, can lead to a transition from the peasant to the entrepreneurial mode of agriculture, making the classic dualism that separates peasants from capitalist farmers inadequate for understanding the complex dynamics that are currently in place in rural areas. "Repeasantization" can also occur, with a quantitative increase in peasant numbers and a qualitative shift towards an overlap of production and consumption within the same farming unit. In the Altiplano Norte both phenomena are observable, and they often overlay. There are instances of return migration of *residentes* to their communities of origin with a resurgence of agriculture within households previously devoted to non-farming activities; at the same time, though, people in rural villages are increasingly involved in multiple activities carried out across rural and urban areas. Smallholders, while still living mainly according to the "peasant condition", embrace income-generating practices that commodify the labour and resources they rely upon and grant themselves monetary gains.

"New and multiple sites of resistance and response" (Bebbington 2001, p.431) to globalisation conditions emerge in the Altiplano Norte *desakota* space. Challenges and opportunities are dealt with in rural communities through people's capacities and favourable global-local

dialectics. As Robins argues with reference to exogenous development interventions, at the small scale people "tend to deploy hybrid and highly selective and situational responses" (Robins 2003, p.265). These are "neither wholesale endorsements nor radical rejections of modernity and its bittersweet fruits" (p.281-282). They can be named "indigenous modernities" (Robins 2003), as they do not necessarily oppose external (and "Western") influences in defence of a cultural autonomy (p.282), but engage, on the contrary, with challenges and opportunities through strategic and contextual choices that straddle tradition and modernity. The selectivity of Aymara people can be noticed in the Altiplano Norte by analysing the propensity of farmers to accept externally introduced initiatives. Unlike others (i.e. the nomination of "custodian farmers") some practices involving urban-based organisations and scientists, such as agrobiodiversity fairs and agro-tourism, have rapidly become established in the Altiplano Norte, where they were incorporated in families' and communities' strategies and lifestyle (7.2.4). Although launched by international and Bolivian organisations, which still support their continuation, they became fully integrated after undergoing a process of reconfiguration according to local habits and culture. Today, they influence the way in which smallholder producers relate to agrobiodiversity. They stimulate farmers to conserve a wide range of seed varieties by giving agrobiodiversity new applications and uses that trigger agrobiodiversity reinvention.

Does migration foster a dialogue between "tradition" and "modernity"?

"Tradition" and "modernity" are two extremely slippery concepts, on the definition of which little consensus exists. The emergence of these artificial categories can be historically traced back to the spread of Western imperialism, when a Euro-centric view of "modernity" started to be introduced in opposition to a non-European backwardness, or "tradition" (Wade 2007; Graburn 2000). In Latin America, as Wade argues, tradition often "ends up being the local, what was there "before" modernity arrived; modernity ends up being construed as something "out there" in the global world, which arrives on the scene" (Wade 2007, p.56). However, today it is no longer possible to apply such a simplistic division between the binaries traditional/modern, local/global and, as clarified previously, rural/urban. Concepts normally considered in juxtaposition with each other become increasingly closer, and the questions arise: "what if the "traditional" is itself a product of global networks that have been operating in the very long term? What if the "modern" is itself constituted through these same networks

and thus not easily distinguishable in temporal and spatial terms from the traditional?" (*Ibidem*).

It is a common trend in anthropological research to explore how local, non-Western people adopt "objects, ideas and symbols from global circuits of production, consumption and knowledge" (p.51), through a process of appropriation or indigenization that leads to the creation of "multiple" or "alternative" modernities (*Ibidem*; Eisenstadt 2000). Robins, with the introduction of "indigenous modernities", belongs to this stream (Robins 2003).

Another preliminary consideration can be introduced with relation to "identity", a fluid concept in today's Altiplano Norte. With reference to cultural identities, Hall argues that they indeed "come from somewhere, have histories", but that "far from being externally fixed in some essentialised past, they are subject to the continuous 'play' of history, culture and power" (S. Hall, 1990, p.225). They are "unstable points of identification", which rather than "an essence" should be considered "a *positioning*" (p.226).

According to Li, indigenous people "have some room to maneuver as they situate themselves in relation to the images, discourses, and agendas that others - [i.e. states, NGOs etc.] - produce for or about them" (Li, 2000, p.157). Their agency plays a crucial role in the choice and combination of elements that form new identities, through a "creative act" that entails "a selection and rearticulation of elements structured through previous engagements" (Li, 2000, p.169). The process of articulation takes into consideration "tradition", just like opportunities and impositions introduced by outsiders.

In the Altiplano Norte region indigenous farmers' identity is rooted in ancient customs and a "traditional" lifestyle, but it is also based on more recent experiences and on stimuli that derive from farmers' interaction with market forces and exogenous actors (i.e. public and private stakeholders, scientists etc.). In urban areas a *cholo-mestizo* identity (Tassi 2010) has taken shape following rural-urban migration, and today it influences people's lifestyle and choices within the whole *desakota* space. In some neighbourhoods of La Paz and in El Alto new identities are the result of a combination between traditional/indigenous elements and modern/urban ones (Lazar 2008; 4.5). The spread of a *cholo-mestizo* mentality in Aymara communities leads to multiple outcomes as far as agrobiodiversity conservation and use are concerned, as I explain in chapters 6 and 7.

Returning to the concept of "indigenous modernities", I should clarify that in the Altiplano Norte the initiatives launched by scientists in the framework of nationally and internationally funded projects are key in the process of agrobiodiversity reinvention. These make farmers

aware of the benefits of agrobiodiversity and reverse the trend towards agronomic simplification, which is otherwise predominant. The creation of "indigenous modernities" concerning agrobiodiversity conservation is linked with the activities implemented in rural communities on the suggestion, and often under the supervision of scientists.

Farmers' involvement in such initiatives is embedded in the complex socio-economic and cultural reality in which they live. Within it rural villages and livelihoods are currently reshaped, and farmers' identity redefined. Therefore, in the Altiplano Norte several elements must be taken into consideration when analysing farmers' strategic and situational responses to contemporary challenges that bear the process of agrobiodiversity reinvention. Some of them directly affect the peasants, their lifestyle and choices, while others concern the broader *desakota* region, and - by generating new opportunities - have an indirect impact on farmers' livelihoods. These are:

- The improved connections between the countryside and the city, which - through an intensified participation of the farmers in the market - inspire a focus on the economic benefits linked with agrobiodiversity conservation and use;
- The openness of Aymara villages towards the outside world that makes interactions with urban actors (i.e. with scientists promoting agrobiodiversity conservation) possible and desirable;
- The emergence of a celebrative rhetoric around native crops and indigenous diets at the national and international level, with an increasing commitment of public and private entities in on-farm agrobiodiversity conservation;
- The food transition, mainly occurring in the major cities of the country, which redefines eating preferences and habits, and creates a new market for native crop varieties and indigenous foodstuff and dishes.

Based on these premises, in this work I explore the intersections between the creation of "new peasantries" and "indigenous modernities" - leading to a reinvention of agrobiodiversity - and the phenomena of rural-urban migration and *in situ* urbanisation within the Altiplano *desakota* space. The following instances are discussed:

- Temporary migration: As a result of their urban experience, temporary migrants are often eager to support the agrobiodiversity conservation initiatives promoted by scientists and NGOs in their villages. Many of them currently engage enthusiastically with these actors, moved by the awareness that advantages can be drawn from their participation in relevant activities.

- Return migration: Return migration is an important asset in the management of recently launched initiatives, such as community agro-tourism. These revive agrobiodiversity in light of opportunities that both return migrant families and "multi-sited" households are more willing and capable to take advantage of, as compared with other farmers.
- *In situ* urbanisation and livelihood diversification: In a "new rurality" framework many farmers who live permanently in rural communities and have never been migrants themselves are able to appreciate a wide gamut of benefits connected with agrobiodiversity conservation. In the Altiplano *desakota* region - with the *cholo-mestizo* mentality expanding to rural areas - the affirmation of the market and the physical and ideal proximity between rural communities and the city lead to the transformation of indigenous farmers' priorities and habits. The openness and the entrepreneurial inclination of some peasants contribute to the incorporation of new ideas and practices in their lifestyle.

It is evident - from this anticipation of the main empirical findings presented in chapter 7 - that not just in spite of but also thanks to migration and livelihood change, local farming systems, knowledge and customs - although permeated with tradition - undergo a process of "reinvention". Agrobiodiversity conservation and use fit into the same picture in which "indigenous modernities" emerge, based on indigenous people's new identities. Agrobiodiversity-related knowledge and practices, far from being stagnant, are strategically reshaped by farmers according to their current interests and needs.

3.3 Research methodology

3.3.1 The preparation of a research plan

As stated in chapter 1, this research aims at exploring the *connections* between agrobiodiversity conservation and farmers' out-migration from rural communities in the Altiplano Norte. The question at the basis of this research was phrased in line with specific methodological choices that I explain here to clarify how the central objective of this work was operationalized through the preparation of a research plan.

Looking at *connections* is intended to favour the capturing of the multiple linkages and mutual influences that exist between agrobiodiversity conservation and migration. I reiterate here the

main reasons why this is crucial in my work: 1) it prevents my analysis from being restricted to the verification of linear causality between these two elements, which only provides a partial understanding of the Altiplano Norte's society-nature interface; 2) it accounts for the multi-directionality of interactions between different components of a complex picture; 3) it delineates this picture in the qualitatively and quantitatively clearest and most accurate way, by identifying existing mechanisms of connection.

As I argued in the previous section, rural-urban migration cannot be reduced to a uni-directional flow of people, resources and ideas. Its causes and consequences are multiple and linked with each other through intricate dynamics. Deagrarianisation and urbanisation, responsible for agronomic simplification, take place alongside the emergence of new identities and opportunities that lead to agrobiodiversity "reinvention". The *connections* that take shape within and across the new physical and ideal spaces emerging in the Altiplano Norte are anything but uni-linear, and derive from complex causal structures.

To turn my central research question into an operational plan, I elaborated a set of hypotheses in the form of mechanisms linking agrobiodiversity conservation and indigenous peoples' migration in the Altiplano Norte. According to Bhaskar, mechanisms are precisely the causal structures that explain phenomena (Bhaskar 1998). The events that we observe in the world are generated by mechanisms taking shape within overarching structures that - although not deterministic - enable and constrain them (Sayer 1992; Bygstad & Munkvold 2011). By relying on this layered ontology (structures-mechanisms-events), key to the critical realist methodology (Sayer 1992), it is possible to uncover and describe what is observed (Bygstad & Munkvold 2011). In particular, through mechanisms we can *explain* events by taking into account the complex reality around them in a research context. Identifying relevant mechanisms is how I sought to *explain* in which ways agrobiodiversity conservation and rural-urban migration are connected with each other in the Altiplano Norte.

Prior to the fieldwork, because I was still unfamiliar with the research area, I used the literature and the communications of scientists and experts to identify a set of mechanisms/research hypotheses that could serve as a basis for my data collection activity in Bolivia. In this preliminary phase, events - "clusters of observations" according to Sayer (1992) - relevant to my research question were, hence, selected through a review of secondary material. Since the preparation of hypotheses/mechanisms could not be grounded on the direct observation of events - due to schedule and time constraints - I did not approach them dogmatically as a set of unchangeable assumptions to be confirmed or contradicted by

fieldwork data. On the contrary, I opted for a flexible approach that allowed me to 1) rely on a solid structure, according to which I could plan my fieldwork activities; and 2) put myself, at the same time, in the methodological condition to progressively adjust my set of identified mechanisms according to the empirical observations that uncovered, over the course of my research work, agrobiodiversity-migration *connections* not taken into account at the outset. During and after my fieldwork, I remained open to not only considering new mechanisms that I had not identified before, but also reshaping the causal structures used as research hypotheses whenever the observed events brought to light unexpected situations or linkages.

While preparing a research plan the existence of two different sets of hypotheses took shape. Through secondary information and logical reasoning I identified two broad categories of mechanisms linking agrobiodiversity conservation and rural-urban migration:

1) Mechanisms leading to agronomic simplification, loss of diversity and preference for high-yielding varieties;
2) Mechanisms leading to a reproduction and reinvention of agrobiodiversity.

Before the fieldwork, mechanisms ascribable to different thematic areas emerged within the first category:

- Reduced propensity towards the conservation of agrobiodiversity amongst farmers due to their detachment from rural communities, loss of native language, interest in non-local foods etc.;
- Change in income-generating activities and shift of resources away from agrobiodiversity;
- Depopulation leading to the abandonment of farming;
- Migration of young people jeopardising seed and knowledge transmission in rural communities;
- Impaired farmers' decision making capacity following migration of household members;
- Remittances fostering an increased purchase of high-yielding agricultural varieties;
- Uniformisation of products due to market proximity.

Within the second one, mechanisms were clustered as follows:

- Increased propensity towards agrobiodiversity conservation amongst farmers due to openness to scientists' work and market opportunities;
- Knowledge transfer and introduction of new material through migrants;
- Investment of remittances in agrobiodiversity conservation.

Annex 2 features a table showing in detail the specific mechanisms - within each one of these thematic areas - that I built prior to the fieldwork, and the strategy I elaborated between 2011 and 2012 to engage with them in the field. In the first column of the table mechanisms are summarised schematically. Hypotheses/mechanisms created a solid yet flexible basis, according to which I structured my data collection work in the Altiplano Norte. The second column ("data needed") includes information about the data that I envisaged would confirm or contradict my hypotheses. For each one of them I looked for and at specific events, in order to verify their existence in the research area. The third one ("data collection methods") contains my plan for gathering the relevant empirical information.

I anticipated in 3.2.2 that I am aware of the fact that my focus on migration - in connection with agrobiodiversity conservation - might be perceived as detracting attention from other social processes that affect rural change. I believe that the novel contribution of my research derives exactly from looking at agrobiodiversity conservation from this deliberately narrow and specific angle. Choosing this focus - as explained in chapter 1 - is useful because understanding the role of migration for smallholder farmers and agrobiodiversity conservation can make new options for dealing effectively with current challenges and opportunities emerge.

As mentioned above, in my research I have sought to maintain an approach that was as open as possible, in order to grasp all the factors that were useful to identify and explore agrobiodiversity-migration connections in the Altiplano Norte. In this thesis a wide range of social, legal and economic processes is discussed, insofar these play a role within the identified mechanisms of connection. Some of these processes are investigated in detail, while others are only marginally discussed, according to the causal relevance they had within such mechanisms.

The processes that I look at closely and engage with extensively in this work because they shape the linkages that exist between the two elements of my research question include the development of an urban market economy, livelihood diversification, the emergence of agrobiodiversity fairs, the increasing presence of NGOs in the research area, the affirmation of new cultural values and public discourse concerning crops and food.

Some other situations are discussed in this thesis in less detail - i.e. the more widespread availability of better education opportunities, legal changes in land management, the distribution of tasks according to gender, the nature and use of remittances. These do not affect agrobiodiversity-migration linkages in a causally traceable manner. In my analysis they are elements of the context in which such mechanisms exist.

Finally, there are dynamics (i.e. the fluctuations in the price of hydrocarbons) that - while potentially relevant to rural transformation processes in a broad sense - are not discussed at all in this work. The reason behind this choice is that they do not contribute in any clearly identifiable way to generating or altering agrobiodiversity-migration connections in the specific study area. Although I explored such factors during the phases of literature review and research design, in the course of the writing process I opted for not engaging with them because I could not identify a causal role in shaping agrobiodiversity-migration connections.

3.3.2 The fieldwork

My fieldwork took place between August 2012 and September 2013 in Bolivia, department of La Paz. I collected qualitative and quantitative data in the rural communities presented in 2.2.2 - Cachilaya, Coromata and Okola - and in the cities of La Paz and El Alto.

Table 3.1 summarises the time structure of my fieldwork. The climatic and agricultural calendar of the region played an important role in activities' planning and implementation. In the Altiplano Norte, overall, winter - the dry season (*época seca*) - begins in June and finishes in October, while summer - the wet season (*época húmeda*) - begins in November and finishes in May. Farmers sow their crops between September and November and harvest them between March and May. However, the beginning of the crop year - marked by the first sowing sessions - and its duration change within these timeframes, according to altitude and proximity with Lake Titicaca. For example, in Okola, the community with the mildest climate amongst the three, crops are sown and harvested slightly earlier than in the other two. When I visited this village in early March 2013, farmers had already begun the harvesting in their fields on the lakeshore. In Cachilaya and Coromata, instead, they did not do so until mid-April.

The weather and the agricultural calendar are crucial elements to take into account in structuring fieldwork in a rural setting, as different moments of the year correspond to specific activities carried out by the farmers. Temporary/seasonal migration and permanent migrants' mobility also take place according to them. I adapted my data collection work (in terms of information sought, timing, and methods used) to the availability of the farmers and their work commitments in agriculture and other livelihoods. For example, moved by the intention to participate whenever possible in the sowing and harvesting moments together with the farmers, I devoted most time during relevant periods to participant observation and interviews concerning agrobiodiversity conservation in rural villages. I concentrated, instead, my data collection work on - broadly speaking - migration, urban life and young people's aspirations in the moments in which farmers were more willing to sit down and rest, and engage in

conversations on these matters (i.e. the dry season, when their work in the fields was less intense).

It is also worth mentioning that farmers' readiness and capability to speak about the agricultural varieties that they owned varied according to the moment of the crop year in which they were approached. During an interview if seeds were in front of their eyes, they were more likely to respond accurately to questions about them. I provide more details about farmers' knowledge with relation to different crop year moments (sowing, flowering, harvesting and post-harvest phase) further below in this section and in 5.4.2.

During my stay in Bolivia I had the fortune of relying on the support of different people and institutions. Those that shaped and enriched my fieldwork the most are the Fundación PROINPA (*Promoción e Investigación de Productos Andinos*), "*Oficina Regional Altiplano*", and my research assistants from Irfoss (*Istituto di Ricerca e Formazione nelle Scienze Sociali*).

PROINPA was my first contact in La Paz and main entry point for my fieldwork in the Altiplano communities. Although I gradually developed a personal relationship with farmers, and visited on my own many times the three villages where I worked, the support of PROINPA staff was essential throughout my whole fieldwork experience, and especially at its initial stage.

As mentioned in 2.2.2, the rural sites where I carried out most data collection work were chosen out of a series of communities in which PROINPA was or had been active. Due to time constraints and to the technical nature of some of the information I needed to gather (i.e. specific data about species and varieties conserved in smallholders' farms, or Aymara producers' agricultural practices), the introduction and the support of an organisation like PROINPA - respected and well-considered amongst Altiplano farmers, and with a four-decade-long experience in agrobiodiversity conservation - was extremely important. PROINPA scientists supplied me with crucial information and gave me access to useful resources; they facilitated my work in the field by assisting me in interviews and focus groups; they helped me to gain farmers' trust and to communicate with those amongst them who did not speak Castellano, by translating for me into and from the indigenous language Aymara; they introduced me to researchers and scientists' networks.

My close relationship with them did not come without consequences. As I explain below their collaboration in my research inevitably generated - in some occasions - biases and limitations to the objectivity of my work. All in all, though, I cannot but be extremely grateful to the people who patiently contributed to a successful implementation of my data collection

activities in a context with which - unlike me, at least at the beginning - they had deeply-rooted familiarity.

At the time of my fieldwork, in Cachilaya and Coromata, PROINPA was implementing 1) a project on the conservation of neglected and underutilised species in a situation of climatic change ("IFAD NUS", third phase, funded by IFAD and coordinated by Bioversity International); 2) a project fostering the sustainable use of native crops and smallholder farmers' market participation ("Andescrop", funded by DANIDA, the Danish International Development Agency); and 3) a project on native potato varieties' conservation (funded by FONTAGRO - *Fondo Regional de Tecnología Agropecuaria*). In 2012-2013 the activities carried out by PROINPA scientists in these communities - to which I often participated - were part of these projects.

In the framework of the "Workshop of Visual Anthropology and Field Research, Bolivia 2013", Irfoss, an Italian institute promoting research and training in the social sciences, provided me with the support of 11 research assistants. They were Bachelor and Master's students of different social science disciplines from five Italian universities. In 2012 I was the winner of a competition for university teachers and researchers launched by Irfoss[29]. As a result, I was involved in the preparation and implementation of this workshop, which had at its centre my PhD research project. I was the workshop's research coordinator and one of the teachers, alongside an anthropologist specialised in visual data collection techniques[30]. The students selected as participants travelled to Bolivia at the beginning of April 2013 and spent a month there.

- The first week in La Paz, to get used to the Altiplano's altitude, climate, and way of living, and to familiarise with the research topic on the ground. Together we attended a series of meetings and conferences in the city (as table 3.1 shows).
- A longer period in Okola - chosen as a case study - where they collected data under my supervision using participant observation, semi-structured interviews and focus groups. We lived on the Titicaca shore as paying guests of the farmers participating in community tourism. Some of the specific activities carried out during our stay in Okola will emerge in the course of this thesis, particularly in 6.4.2 and 7.3.1.

A few clarifications are necessary. Firstly, the selected workshop participants/research assistants were encouraged to familiarise with my research project before travelling to Bolivia.

[29] "Bando Docenti e Ricercatori", http://www.irfoss.it/bandi-docenti-ricercatori/vincitori/vincitori-2012-2013.

[30] For more information about the workshop and relevant activities: http://www.irfoss.it/news/bolivia-2013_workshop_antropologia_visuale.

Table 3.1: Main fieldwork activities by month

Month	Activities
August 2012	Archival research and interviews with scientists and development workers in PROINPA, CARE Bolivia, PROSUCO, Fondo Indígena, UMSA, AGRUCO, INE. Selection of rural fieldwork sites. Participant observation in the agrobiodiversity fair of the community Rosapata, municipality San Andrés de Machaca.
September 2012	First visits to Cachilaya and Coromata: - Participant observation and interviews with individual farmers mostly concerning migration; - Participant observation in workshops and trainings organised by scientists (preparation of compost and fertisol); - Focus group in Cachilaya. Interviews with scientists in La Paz and El Alto. Participation in the workshop "Classifying levels of wellbeing in a rural community" in PROINPA.
October 2012	Cachilaya and Coromata: - Participant observation in crop sowing sessions; - Participant observation in workshops and training sessions organised by scientists; - Interviews with individual farmers. Participant observation during the gastronomic fair "Tambo" held in La Paz. Participation in a workshop on community management of on-farm agrobiodiversity in CARE Bolivia.
November 2012	Cachilaya and Coromata: - Participant observation in crop sowing sessions; - Participant observation in workshops and training sessions held by scientists; - Sowing of community seed bank and demonstration plots. First visit to Okola. Participation in the celebrations of the anniversary of the province Carabuco together with Okola's traditional authorities. Participation in a workshop on agrobiodiversity and climate change in CARE Bolivia. Participation in the *Taller Abierto de Preparación al Censo Nacional de Población y Vivienda 2012*, organised in Yanacachi, Los Yungas, by

	the *Fundación Pueblo*. First visit to the *Centro Experimental Quipaquipani*.
December 2012	Cachilaya and Coromata: - Participant observation in crop sowing sessions; - Participant observation in workshops and training sessions held by scientists (pest control); - Focus group in Coromata; - Interviews with individual farmers.
January 2013	Cachilaya and Coromata: - Regular visits and longer stays in both communities; participation in community life; interviews with individual farmers; - Participant observation in the affiliation campaign of the agronomic insurance agency PROFIN (*Fundación para el Desarrollo Productivo y Financiero*). Okola: - Participant observation during festive events; informal conversations with farmers. Collection of material from the municipalities' offices (Batallas, Huarina, Carabuco).
February 2013	Cachilaya and Coromata: - Regular visits and longer stays in both communities; participation in community life; interviews with individual farmers; participation in emergency harvesting sessions. - Structured survey through PROINPA's questionnaire (see next section); - Focus groups. Participation in the Annual Meeting of the IFAD NUS project in La Paz.
March 2013	Cachilaya and Coromata: - Regular visits and longer stays in both communities; participation in community life; interviews with individual farmers. Preparation and celebration of the *Día de Campo* ("Field Day"), organised by farmers and scientists in Cachilaya (5.3.1); participation in emergency harvesting sessions. - Structured survey through PROINPA's questionnaire. Okola: - Regular visits and overnight stays in preparation of the visit of the Irfoss team.
April 2013	The following activities involved the 11 Irfoss research assistants and took place in the framework of the "Workshop of Visual Anthropology and Field Research. Bolivia 2013" (2-24 April 2013).

	Participation in conferences in: - PROINPA; - UMSA; - UPB; - INESAD. Participation in meetings with the anthropologists of ADA. Okola: - Participant observation and interviews; - Participation in harvesting sessions; - Focus groups and workshops with schoolchildren. I performed the following activities individually, before the arrival and after the departure of the Irfoss students. Cachilaya and Coromata: - Participant observation in harvesting sessions and in community meetings. Visit to the laboratories of INIAF (*Instituto Nacional de Innovación Tecnológica Agropecuaria y Forestal*), the *Estación Experimental* Toralapa, and the laboratories of PROINPA in the department of Cochabamba, together with a group of custodian farmers from Cachilaya and Coromata.
May 2013	Cachilaya and Coromata: - Participant observation in harvesting sessions; - Harvesting of community seed bank and demonstration plots; - Participant observation in the focus groups on agrobiodiversity and climate change organised within the framework of the project "*Andescrop Difusión y Comercialización*"; - Structured survey through PROINPA's questionnaire; - Participant observation in a cooking workshop organised by PROINPA for farmers.
June 2013	Cachilaya and Coromata: - Participant observation and interviews during the post-harvest phase; - Structured survey through PROINPA's questionnaire. Participation in the Scientific Congress of Quinoa organised by IICA (the Inter-American Institute for Cooperation on Agriculture) in La Paz.
July 2013	---
August 2013	Cachilaya and Coromata: - Participant observation and interviews during the post-harvest phase. Collection of material from PROFIN and the tour operator La Paz on Foot.

September 2013	Cachilaya and Coromata: - Participant observation and interviews during the post-harvest phase; - Participation in agrobiodiversity fairs.

Own elaboration.

In La Paz - after their arrival and prior to the beginning of the fieldwork in Okola - I provided them with an initial induction, in which I informed them of my preliminary findings - based on the data collected in Coromata, Cachilaya and Okola between August 2012 and April 2013. I also explained to them in detail my research objectives and my interests regarding the specific case of Okola.

Secondly, when the fieldwork started, they were provided with training[31] on the different data collection methods. Every day our time would be divided between research methods and visual anthropology classes and data collection work in the community.

It would be reductive to say that the Irfoss students were mere executors of the fieldwork activities that I organised. Indeed, they worked according to my instructions and respected the timeframe I established and the requests I formulated based on my research objectives and plan. However, they also enriched my fieldwork experience invaluably through not only the data they obtained, but also their contribution in the numerous discussions we had during our stay in Okola. At the end of each working day, we would gather for a debriefing session in which team members - besides reporting on the work done during the day - could share their concerns and personal reflections. Through these debates I had the chance of discussing with my research assistants their views about migration and agrobiodiversity conservation in Okola and their considerations regarding the case study we focused on within the framework of my broader research project.

The workshop participants were invited to keep a diary during their fieldwork. Because of the personal nature of the information I encouraged them to write in their notes, I never asked them to share these with me. However, the discussions I had with them - both individually and in a group setting - allowed me to get a comprehensive coverage of each research assistant's observations and reflections. During and after my meetings with them I wrote my own notes (referenced in this thesis as "*Fieldnotes*"), which incorporated, alongside my own observations and considerations, the reflections emerged in these discussions.

[31] Our classes took place in the school of Okola, in a room made available to us by the school director in agreement with the *junta escolar* (school's committee). Occasionally, though, classes were held outdoors in the community due to practical reasons or because photography and video-making exercises made it necessary.

The Irfoss students also compiled detailed spreadsheets, in which they transferred - arranged by household - the data they collected. Furthermore, because of the visual anthropology component of the Workshop, students were encouraged to perform a series of exercises involving the use of photography and video-making for the collection of primary data. Seven interviews with Okola farmers were filmed and subsequently transcribed. In addition, the group's fieldwork in the community and interaction with the farmers produced a considerable number of pictures, which were used both for the application of the photo elicitation technique (discussed at the end of this section in the paragraph "*Visual techniques*") and for data presentation purposes (for example in this thesis with the permission of the photographers).

There are many other organisations and people I engaged with during my fieldwork, benefitting from their precious support and contribution. Explaining in detail the specific contribution of each one of them would go beyond the scope of this section. However, information about them, the events I attended, and the specific data collection activities I performed in both rural and urban areas can be deduced from table 3.1.

Data collection methods

I used different methods for the collection of qualitative and quantitative data, chosen according to

- the type of data I was seeking;
- the specific moment of my fieldwork;
- the activities that scientists and NGOs carried out in parallel to my work in my fieldwork sites.

Before analysing my use of each method, I will make some preliminary clarifications. While these are necessary for understanding my application of different data collection techniques in the field, they unavoidably anticipate some of the findings that I discuss in detail in the next chapters.

To begin with, I would like to point out that I never considered performing a systematic agronomic monitoring of agrobiodiversity in the three villages where I worked as an essential component of my fieldwork.

Firstly, my focus on *connections* did not necessarily entail such an undertaking. Although I did seek to obtain precise data on the seeds that farmers owned, my objective was not to compile

a database of agricultural varieties, but, instead, to explore the linkages and mutual influences between agrobiodiversity conservation practices and use, and the phenomenon of rural-urban migration. The collection of quantitative data on agrobiodiversity (i.e. number of crop varieties in farmers' plots and their names) was, therefore, mainly intended as an instrumental step in investigating how and why different seeds are conserved by smallholders. These data created a solid basis for my reflections on farmers' relationship with their seeds vis-à-vis their direct or indirect participation in migration and the transformations occurring in their communities.

Secondly, comparing the trend of agrobiodiversity loss with the trend of rural-urban migration would have restricted my analysis to an assessment of linear causality, which, as explained previously, is reductive within the complex Altiplano Norte research area.

Thirdly, as interesting as comparing the two trends would have been, it would have not been feasible for one individual researcher with limited availability of time to build sets of quantitative data including information about, on one hand, the agricultural varieties that farmers cultivated in their fields, and, on the other hand, their temporary or permanent movement away from rural communities. A series of circumstances - concerning data collection about both agrobiodiversity conservation and migration - would have made that impossible. Describing these circumstances is useful to understand the challenges that I faced during my fieldwork and the reasons that induced me to choose specific information sources and methods.

As far as agrobiodiversity conservation is concerned, the following considerations apply:

1. The range of seeds that farmers own is extremely broad. Farmers' families can cultivate up to several hundreds of crop varieties in their fields, as Annex 1 shows for a sample of 28 households from Coromata. It is impossible for a single researcher to carry out a detailed investigation of agrobiodiversity in three villages in one year's time.
2. In order to obtain thorough information about agricultural varieties from interviews with farmers, people must be approached in the harvest or post-harvest phase. Indigenous producers conserve a large number of seeds, but they sow most of them in a few furrows on a side of each plot (chapter 5). Most of the land is sown with a narrow range of high-yielding varieties. While smallholders can always and fairly easily report on the varieties they have used most of their land for - roughly the same in the whole Altiplano - they are generally unable to tell which ones they have sown in the tiny portions of land reserved to most varieties, unless they have their seeds at hand. Otherwise, it is extremely difficult for them to provide the names of the agricultural varieties that form their diversity portfolio. Interviews must take place in the harvest

phase, when farmers take stock of the varieties they have, or in the post-harvest phase, when they can take their seeds out of their storage space and show them to the interviewer. The available time for data collection through interviews is, therefore, relatively short within the crop year.

3. Farmers' way of classifying crop varieties is not homogeneous across the Altiplano region. Producers from different communities often use a different nomenclature for the same seeds (5.3.1). Although in the last decades scientists have been working at the compilation of a comprehensive database - listing agricultural varieties according to their scientific name (when one exists) and their indigenous name(s) - such a document is not yet available for the Altiplano Norte. Records with information about the agrobiodiversity that is conserved in different regions have been assembled by agronomists and geneticists (i.e. from PROINPA and INIAF) based on technical criteria, mostly in the framework of *ex situ* conservation. However, as far as on-farm conservation is concerned, exact classifications of crop varieties according to the nomenclature used by farmers are still in the process of being elaborated. Individual researchers have produced studies about specific indigenous communities, with reference to small samples of producers. Mapping agrobiodiversity is an extremely complex process, which requires the active collaboration of farmers. Performing crosschecks between technical knowledge and indigenous knowledge is a tremendously laborious and time-consuming work. The one-off studies conducted so far are intended to provide a basis for a future systematic monitoring of on-farm agrobiodiversity, as I explain in 6.2.
4. Following up from the previous point, scientists have not yet carried out a systematic monitoring of agrobiodiversity over time, neither in the villages where I worked nor in the Altiplano Norte in general (6.2). While some individual researchers have recently investigated the characteristics of agrobiodiversity in Cachilaya, Coromata and Okola, information about conserved agricultural varieties by family is not included in the final documents summarising their work, and obtaining raw data sets from authors is notoriously difficult[32]. Hence, even if I had managed to conduct an agrobiodiversity survey in these villages between 2012 and 2013, I would not have had any exact data about the agricultural varieties conserved in the past in my fieldwork sites - essential for drawing a comparison.

[32] The agronomist Vania Alarcón was the exception, as she kindly shared with me the raw data at the basis of her work "*Inventariación de la agrobiodiversidad en la comunidad Coromata Media*", 2011.

Given these challenges, in order to obtain useful data on on-farm agrobiodiversity, I crossed information from different sources. I relied on secondary data, i.e. on the reports of the *Fundación* PROINPA and the studies of UMSA researchers - retrieved during my fieldwork - which included information about agrobiodiversity management and the role of different variables in conservation practices in specific Altiplano communities. In addition, I collected first hand data through interviews with farmers. As discussed in point 2 above, the data on agrobiodiversity conservation collected in interviews present some limitations. If farmers are asked questions about the agricultural varieties that they cultivate during a conversation, or within the framework of a survey, they tend to only mention a few of them - those that they produce in the largest quantity and that contribute the most to their family's food security. The other varieties - most of the time - are not even named, and - if confronted with additional questions - interviewees are likely to dismiss their interlocutor with a "*no recuerdo*" ("I don't remember"). Because it was not feasible for me to interview all farmers I was working with during the harvest and post-harvest months, I used agrobiodiversity fairs as platforms for gathering exact information on conserved seed varieties and farmers' knowledge. I will explain later on what agrobiodiversity fairs consist of and how farmers participate in them (5.4 and 5.5). For the time being it is enough to say that they are events in which smallholders showcase their seed diversity, alongside traditional dishes and handicraft. During these fairs I could collect data on varieties owned by farmers at the household and at the community level[33].

Reliable and thorough data on rural-urban migration in the Altiplano Norte also do not exist. This is partly due to the sporadic nature of demographic data collection at the institutional level in Bolivia (a census was conducted in 2012, while the previous one dated back to 2001; over the last decades municipalities have not regularly collected accurate statistical information either). Furthermore, it derives from the fact that the rural-urban exchange that has taken place since the 1950s between the Altiplano rural and urban areas has been extremely chaotic and un-regulated. Today indigenous people move frequently and continuously within the *desakota* space embracing La Paz and El Alto and the surrounding Altiplano communities. Temporary and permanent migration movements do not occur

[33] It is impossible to be entirely sure that the varieties that farmers showcase on the day of the fair are exactly the same that their family cultivates in agricultural fields. Some seeds might be received by participants as gifts; others borrowed, or bought with the specific intention to perform well in the fair. Although it is important to be aware of this, it cannot be denied that agrobiodiversity fairs offer - on a yearly basis - an effective tool for collecting the most accurate data about agrobiodiversity, as the literature argues (Sthapit et al. 2006: Jarvis et al. 2011 and 2000) and as local scientists confirm.

through official channels and it is, therefore, impossible to express these phenomena with exact numbers with reference to the broad Altiplano area. Finally, regardless of the place where they spend most time during the year, migrants consider themselves as "rural"/"indigenous" or "urban" based on subjective criteria connected with their sense of belonging and/or their convenience (4.4; 4.5).

Given the complexity of the Altiplano Norte rural-urban scenario, documenting migration and the processes of deagrarianisation and depopulation of indigenous communities is extremely challenging. However, with reference to my specific fieldwork sites, I managed to turn it into a feasible task. The sample I took into account was relatively limited. All three communities where I worked count on average around two hundred families each. I worked closely with 24 families in Cachilaya, 24 in Coromata and 16 in Okola. In order to retrace a satisfactory migration picture for these villages I relied on 1) the decreasing school enrolment rate, as the main numeric parameter of reference; 2) presences and absences within each household; and 3) inhabitants' accounts of depopulation and youth migration, which I considered as trustworthy evidence of these phenomena in such tiny villages.

Below I present and discuss the data collection methods I employed in my fieldwork. They are dealt with in chronological order, with reference to the moment in which I used them for the first time while gathering information in the Altiplano Norte. It should be noted, however, that I did not replace one method with the next over the course of my fieldwork. On the contrary, after the introduction of each one, I used them in combination most of the time.

Archival research. While I was in Bolivia, I used a number of databases in search of secondary data, as shown in table 3.1. Particularly at the beginning of my fieldwork I engaged with the material available in PROINPA to select the rural communities where to focus my work. Throughout my whole fieldwork experience, though, I gathered information from universities and research centres (UMSA, UPB, AGRUCO, PROSUCO); NGOs (PROFIN, CARE Bolivia) the Instituto Nacional de Estadística (INE); and the offices of the municipalities Batallas, Huarina and Carabuco, where I retrieved the "*Planes de Desarrollo Municipal*" ("Municipal Development Plans" - PDMs).

Participant observation. When using participant observation the researcher collects data during an extensive period of time and through a direct involvement in the activities performed in the research area. In order to understand the reasons that determine the choices and actions of research participants and the interpretation they give to the social and natural

phenomena they experience, the researcher takes an active role within the studied context, by not only observing but also interacting with people (Kawulich 2005; Baldinelli et al. *unpublished*). During my fieldwork, participant observation was the first method I implemented in rural communities. By using it, I aimed to learn about farmers' lifestyle and livelihoods, while gradually becoming familiar with the territory and with people's work and habits. I also meant to identify key informants that could be involved in individual interviews and focus groups later on. In Coromata and Cachilaya, although I was introduced to farmers by an organisation that they had known for years, it took me time and effort to gain people's respect and trust. Suspicion and laughter were the initial reactions of Aymara smallholders to my attempts of taking part in some of the moments of their agricultural and community life. Nevertheless, when the sowing period arrived (in October), I was allowed to actively participate in the agricultural work that is generally reserved to women (i.e. the preparation of the seeds, and the actual placement of seeds and manure in the furrows). This was achieved after visiting the communities regularly and frequently for almost two months, observing and occasionally helping in activities like the preparation of natural fertilisers and compost, performed by farmers during the dry season under the guidance of PROINPA. During the time I spent in rural villages I managed to observe and participate together with the farmers in a number of activities taking place in public spaces or anyway outdoors (i.e. sowing, harvesting, seed selection, authorities' meetings, eating of the shared traditional meal *apthapi*), as well as in more private ones (i.e. cooking, family eating). In this thesis my observations are referenced as "*Fieldnotes*". Once again, it should be noted that Okola was a particular case because, besides some visits I paid to the community on my own, my work there was characterised by the collaboration of the Irfoss team. Participant observation was used by all members and - as explained above - the individual experiences and the observations of each of them were shared with the rest of the group during extensive discussion sessions at the end of each day of work.

Unstructured, semi-structured and structured interviews. Unstructured interviews are conducted when interviewees are allowed to speak freely in response to open questions, by providing information according to their own choice of structure, priorities and time (Bichi 2007; Baldinelli et al. *unpublished*). In rural villages I used them particularly at the outset to identify key informants for more structured interviews and to adjust the relevant list of questions according to the data I obtained through both unstructured interviews and participant observation. Nevertheless, throughout my whole fieldwork, I engaged in informal conversations with farmers to obtain specific information or clarifications, and in casual

(although at times extremely detailed) chats with migrants, especially during my bus journeys between La Paz and the rural villages. I also had in-depth discussions with scientists and experts from the organisations mentioned in table 3.1, in La Paz, during our trips together to the field and in rural areas.

Semi-structured interviews follow a specific sequence of questions. Space, however, is allowed for digressions, and for clarification and follow-up comments. In Cachilaya and Coromata, the farmers who, more than others, participated in semi-structured interviews were the members of APROCA and ADAMA[34] - producers' associations created recently with the support of scientists. It was relatively easy to approach them because of their participation in a series of initiatives proposed and guided by scientists. However, in order to engage with a more heterogeneous sample, I involved non-member farmers as well. The same applies to the case of Okola, where initially interviewees were mainly the farmers who hosted us in their homes. After interviewing them, we did our best to extend our data collection work to other community members.

The data collected through both unstructured and semi-structured interviews are referenced in the empirical chapters as "*Interview(s)*". The list of questions that was used in all three communities as a guide in semi-structured interviews is included in Annex 5.

Structured interviews took place in the form of a survey (the data obtained through structured interviews are - therefore - referenced in this thesis as "*Survey data*"). As mentioned above, in some occasions I had to adapt my fieldwork to the activities of local scientists. At the beginning of 2013, within the framework of the project "Andescrop", they began to collect data on several aspects of farmers' life by means of a structured questionnaire (see Annex 6), with the purpose of compiling a baseline for enhancing this project's effectiveness. In each community farmers were interviewed individually during sessions lasting between 45 and 90 minutes. Incentive goods (i.e. fumigation masks) were given to interviewees at the end of each session. I decided to support PROINPA in their structured data collection work for the following reasons:

1) The questionnaire touched on a number of aspects that I was covering as well in my interviews.
2) Farmers from the same communities could not be asked multiple times and by different people to participate in long interview sessions - for them a tiring, time-consuming and "unproductive" activity. Such a request would irritate them and many would have anyway refused to sit in two different fairly long interview sessions so

[34] In 2010 PROINPA assisted farmers in the creation of two associations with legal capacity - APROCA (*Asociación de Productores y Conservadores de Cultivos Andinos*), with 24 registered member families, was established in Cachilaya, and ADAMA (*Asociación de Agropecuarios Multiactiva del Altiplano*), 21, in Coromata.

close to each other in time. The accuracy of interviewees' responses would have also been jeopardised by interview fatigue.

3) By joining the team of "Andescrop" interviewers I could enlarge my sample. Some of the other interviewers were Bolivian Aymara-speaking scientists, so I could indirectly cover a large portion of farmers who did not speak Castellano. Furthermore, incentive goods - bought with the project's funds - compensated participants for their time and effort.

By merging the information obtained from these different types of interview, I could trace the farm and migration histories of families from the three communities.

Focus groups. Data collection through a focus group occurs when a number of individuals is brought together with the purpose of discussing issues that are relevant to the research topic. A facilitator poses questions to participants, who are encouraged to discuss with each other to reach an agreement on the response to be given. The final response is as important as the group discussion process, in which different perspectives, as well as power dynamics, emerge (Corrao, 2005; Baldinelli et al. *unpublished*). Several focus groups took place in Cachilaya and Coromata. With the support of a translator I proposed and facilitated one in each community. In addition, I assisted and contributed to other three focus groups, proposed and coordinated by local scientists. In these sessions techniques like discussion based on multiple choice questions and participatory mapping were applied[35]. In the framework of a photography workshop that the Irfoss team offered to Okola schoolchildren (6.4.2) a focus group (involving 24 teenagers) was conducted in this community too.

Visual techniques. Photography has been a crucial part of my relationship with farmers throughout the whole fieldwork. Initially it was an important but rather casual component of my data collection work: I took pictures during those that I considered significant moments (i.e. sowing sessions or meals); I was asked to take pictures (i.e. of *papa* seeds, people, families); I let farmers use my camera and take pictures according to their preferences and on-the-spot

[35] Three focus groups took place in Cachilaya: the first one (26-09-2012) - which I facilitated together with a Bolivian researcher working for Bioversity International - involved five participants (two women and three men) and took place in the house of one of them; the second one (20-02-2013) - facilitated by a scientist from PROINPA - involved seven people (two women and five men) and took place in the *sede comunitaria* (the community centre); the third one (21-03-2013) - also facilitated by a PROINPA scientist - involved 19 farmers (fourteen women and five men) and took place in the *sede comunitaria* as well. Two focus groups were conducted in Coromata: I facilitated the first one (03-12-2012), which involved six participants (three women and three men) and took place in a room of the *Centro Bartolina Sisa*, a centre that provides indigenous women with support and capacity building (its construction was funded by the *Fondo Indĺgena*); a scientist from PROINPA facilitated the second one (17-03-2013), which involved 14 farmers (eight women and six men) and took place in the courtyard of the *sede comunitaria*. When I was the facilitator, the conversations of the focus group were audio-recorded. I took notes in the sessions that I did not moderate.

inspiration (and I got pictures of myself with farmers, of farmers, of crops and landscapes). Furthermore, on several occasions I had individual and family portraits printed in La Paz, and I handed the photographs to the farmers I had engaged with more closely, as a gesture of friendship and gratitude. Since April 2013, when the "Workshop of Visual Anthropology and Field Research" sponsored by Irfoss took place, I incorporated visual techniques in my research methodology more consciously, particularly photo elicitation, based on the idea of including visual representations (photographs, videos, paintings etc.) in interviews (Collier & Collier 1986). By relying on a visual support and asking interviewees to comment on it, barriers created by language and cultural differences are reduced (Bignante 2010). In research settings, because interviewees feel relieved from the stress of being the subjects of an interrogation - as attention is focused on a visual element - conversations flow more spontaneously, and it becomes possible to elicit more information than in conventional interviews (Baldinelli et al. *unpublished*). In Cachilaya, Coromata and Okola this method was applied during dedicated sessions (i.e. in the framework of the "Workshop of Visual Anthropology and Field Research" in Okola my research assistants and I held some photography sessions with schoolchildren - 6.4.2); in interviews; while conducting participant observation. In particular, by allowing farmers to freely use my camera, I could ask them to comment on pictures taken by them, myself or other farmers.

As stated above, I worked closely with 24 families in Cachilaya, 24 in Coromata and 16 in Okola. In order to obtain detailed information on agrobiodiversity conservation and migration with reference to these 64 total households, I had to use - as already clarified - a combination of methods and sources. Furthermore, in order to be able to draw a complete picture of their lifestyle, preferences and livelihoods, I often had to collect the necessary data by repeatedly engaging with the same informants throughout my fieldwork. For example I spoke with farmers and observed them in different phases of the crop year - i.e. during the sowing/harvesting seasons; in different moments of the day and under different circumstances - i.e. while they were hosting me in their houses or I was working with them in their agricultural plots; during *apthapis* or family meals; during agrobiodiversity fairs. Annex 3 includes an example of some of the data I could rely on for each household at the end of my fieldwork.

Some limitations

During my fieldwork some occurrences generated a bias in my data collection work. Whenever feasible, I eliminated them while I was in the field (i.e. like in the case of interviewees' selection). However, this was not always possible. I acknowledge the existence of some limitations, taken into due account in the analysis of the data. While some problematic situations have already emerged from the fieldwork narration, the list below is intended to summarise the main ones for the sake of clarity.

1. I was introduced to the Aymara farmers of my fieldwork sites by the scientists of a local organisation - PROINPA. I was often in rural communities at the same time as them, and - for research purposes - I participated several times in their activities. This inevitably shaped participants' perception of my work with them. The presence of this institution in the Altiplano Norte is deeply rooted, after decades of work on - initially - agricultural modernisation, and - more recently - agrobiodiversity conservation and sustainable rural development (5.2). As much as I wished to be more independent, collecting data in indigenous communities without relying on such assistance would not have been possible for me. Firstly, it would have taken me much longer to access the communities and gain farmers' trust. Secondly, I would not have been able to rely on any background information about the fieldwork sites. Thirdly, I would not have benefitted from the cooperation of expert agronomists, whose support was crucial for me - a social scientist with little technical knowledge - during the collection of data on agricultural varieties. Finally, I would not have had the opportunity to observe how farmers/migrants relate to the work of NGOs. The presence of external stakeholders in rural villages opened some interesting perspectives with specific reference to my research topic.

   Although this did not cause any major difficulty in the process of data collection, I must admit that the attitude of many farmers and their responses in interviews was influenced by the fact that they associated my work with PROINPA's. For example, during our conversations, they would over-emphasise seed productivity issues or problems concerning pests and diseases attacking their crops (as if - by alerting me - they could obtain support on these matters in the framework of NGOs' projects). At the same time, they would under-emphasise issues regarding livestock or non-agricultural livelihoods. I can tell that my questions on rural-urban migration sounded odd to most smallholders I engaged with, because - unlike those about agriculture - they touched a sphere that is considered private and that is seldom a subject of

discussion between them and agronomists. On several occasions this proved, however, to be an advantage. Conversations on such topics would flow without any worries on the farmers' side. Many of them were actually eager to tell me about their own or their family members' migration experiences.

2. I sometimes had to adapt my data collection work to the activities that scientists were conducting in my fieldwork sites, so to achieve the best results with the least annoyance/"waste of time" for the farmers. I already explained in detail the rationale behind this.
3. In Okola I collected data together with a group of 12 white foreign young people. On top of our being outsiders - as it also was the case for myself during my individual work in the other two communities - we also were paying guests, hosted in the farmers' homes in the framework of an agro-tourism project. Farmers mostly treated us as guests, returning the "tourist gaze" (Urry 2002) to us. I discuss this in detail in 7.3.1, while in 6.4.2 I analyse the attitude of Okola children towards the Irfoss group.
4. In the villages of the Altiplano Norte farmers speak Aymara amongst themselves. I had to use translators on numerous occasions, as many people, particularly elderly and women, are not fluent in Castellano. During interviews and focus groups, data would emerge in Spanish most of the time, but quite often also in Aymara. While I am fluent in Castellano and could engage with Spanish-speaking informants independently, the Aymara that I picked up - although sufficient for exchanging greetings and basic information - was not enough for me to carry out on my own complex and lengthy conversations with indigenous interlocutors.

   As a researcher collecting primary data in an environment different from my own's, I had to face the challenges linked with juggling different languages during my fieldwork. I had to use translators - occasionally these were the Aymara agronomists working in the communities; whenever possible, however, particularly after spending some time in the communities, I recruited them amongst bilingual farmers, in the attempt to gradually reduce the distance between the research participants and myself. By relying on calm and polite manners and by making every effort to gain the acceptance and the trust of my interlocutors before sitting with them in an interview, I sought to minimise as much as possible disruptions and potential biases. These could have been caused by two main elements: 1) the inevitable presence of translators; 2) the fact that - as an outsider - I sometimes had to ask for clarifications and explanations that a local would possibly not have needed.

Throughout the recording, transcription and analysis processes I also had to find a way of handling effectively the coexistence of different languages in my data collection work. Firstly, I should clarify that fieldnotes - which mainly covered the results of participant observation and unstructured interviews - were taken almost entirely in English (although - for time and practical reasons - some passages were occasionally written in Italian, my mother tongue). Spanish was the language in which I recorded and transcribed the data I obtained through semi-structured interviews and the survey. This was for me a straightforward choice, as in the field verbal information would always be given to me in Castellano. Also when my interlocutors' language was Aymara, I would eventually receive their responses in Spanish, because translators would interact with me in this language.

Secondly, I should highlight that in both my fieldnotes and - afterwards - in this thesis I sought to report the information I gathered from indigenous farmers as faithfully as possible, although sometimes this required translating the narrative of my interaction with them into a third language (English). While this thesis is in English, the mixture of languages that characterised my experience in the Altiplano Norte is partly reflected by the presence of quotes - which I chose to report in Spanish, followed by a translation in English - and of Aymara words, which I included whenever they described concepts, practices or objects that do not exist as such outside the specific Altiplano context (i.e. *ayni*, *apthapi*, *Pachamama*, the names of local dishes or crop varieties).

4. Neither rural nor urban: Migration of Aymara farmers in a *desakota* region

4.1 Introduction

This chapter explores the deagrarianisation, urbanisation and livelihood transformation processes in the Altiplano Norte. Three different levels of analysis are taken into consideration: 1) macro, with a structural analysis of the "propelling forces" (Rigg 2006) generating the phenomenon of rural-urban migration (4.2); 2) micro, with a focus on decision-making, based on an evaluation of costs and opportunities in farmers' families (4.3); 3) meso, with a description of migrants' networks between places of origin and places of destination in a *desakota* space (4.4). These three layers are merged into a comprehensive picture to show how migration plays a crucial role in the distribution of resources and in the reconfiguration of categories, values and priorities in the countryside, as well as in the city. The features of the rural-urban continuum La Paz-El Alto, spreading out to Altiplano indigenous communities, are analysed in detail, with a particular focus on the *cholo-mestizo* lifestyle, now rooted in the North-Eastern neighbourhoods of La Paz and in the city of El Alto, where rural migrants settle (4.5).

In the next pages I present and analyse the relevant data I collected in La Paz and El Alto and in the rural communities Cachilaya, Coromata and Okola. I also engage with a series of academic sources to produce a dialogue between literature and evidence from the field. During my fieldwork, in order to learn about indigenous farmers' migration, lifestyle and aspirations, I used participant observation, unstructured and semi-structured interviews and focus groups. I interacted with farmers, *residentes* and NGOs' staff on public transport from the city to rural communities and in the three indigenous villages. I observed and spoke with people in La Paz and El Alto, particularly in urban markets and during *cholo-mestizo* festivals. I gathered scientific publications, newspaper articles and secondary material through archival research in NGOs (i.e. PROINPA, PROFIN) and public offices (i.e. INE, the municipalities' offices).

4.2 The transformation of rural livelihoods: outlining the main trends in the Altiplano Norte

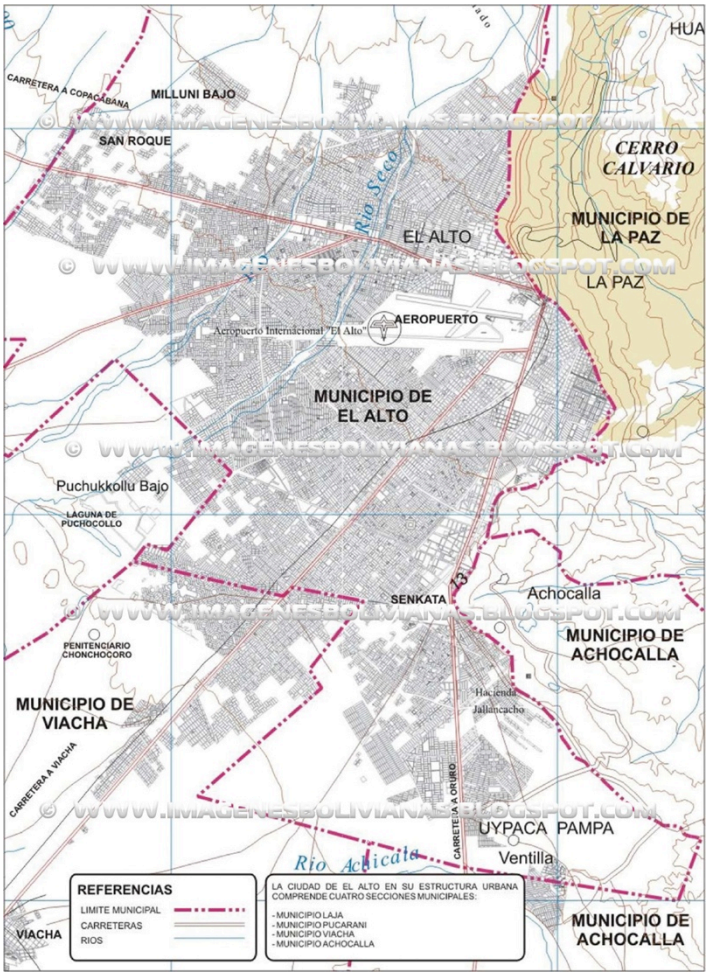
4.2.1 Urbanisation

In the Altiplano Norte migration is a deeply rooted phenomenon (2.4.2). During colonial times movement in this region was towards the main urban area - La Paz - from the *ayllus* surrounding it, and involved people attracted by employment opportunities in commerce and domestic service. The migration in-flow was traditionally marked by a clear occupational differentiation based on ethnicity and a strong female presence. The repeated waves of migration, according to Albó (1977), led to the establishment of an "urban Aymara culture" (p.31) in La Paz. According to Criales Burgos' analysis, since its foundation, this city was characterised by two souls - an indigenous one, and a Spanish/*mestizo* one - coexisting on the basis of interaction and, at the same time, opposition. In this context migrants' networks were important, with rural people settling in the city thanks to the connections and support of urban relatives migrated there before them (Criales Burgos 1994). As Glave (1987) argues, the presence of Aymara people in La Paz was qualitatively and quantitatively crucial in the development of a specific profile for this city, which can still be observed in the present.

Urbanisation is a distinctive phenomenon of contemporary Bolivia. Today the main urban centres of the country are growing in size and population, as the data of the latest national census, carried out in 2012, clearly show. El Alto, in particular, has recently experienced a significant population increase that will continue, according to estimates, in the next decades. Between 2001 and 2012 the number of its inhabitants has gone from 649,958 to 848,840 with a growth rate of 2.45% per year. The population of Santa Cruz de la Sierra and Cochabamba has also grown substantially. Santa Cruz, in particular, has become the most populous city in Bolivia, followed by El Alto. On the contrary, La Paz, according to the census, has experienced a demographic drop between 2001 and 2012, going from 793,293 inhabitants to 764,617 (Candela 2013; INE 2014). This occurrence is particularly significant in the framework of the transformation process that Bolivia is experiencing. In Spring 2013, when figures about it were published, Bolivians received them with surprise. Many of the people I spoke with in both urban and rural areas would question the census' fairness and reliability (Fieldnotes 4/10-06-2013), providing different explanations for its unexpected and seemingly unrealistic results.

- La Paz had reached its maximum expansion limit and could not receive any more people. As a city with an already high population density, buildings in the centre have expanded vertically for decades to accommodate a larger number of inhabitants. The literature confirms that due to its physical shape and geographic location in a small and steep basin, La Paz cannot expand more than what it has already done towards the South-West (Arbona & Kohl 2004), where elites have moved "to enjoy a better climate and lower altitude" (Potter & Lloyd-Evans 1998).
- El Alto - geographically contiguous to La Paz and situated on the Eastern flatland bordering the *hoyada* (the "hole", as *paceños* call their city) - had become the place where incoming Aymara migrants settled.
- The realisation of the census was flawed, as Candela (2013) also argues. I expand on this in 4.4 and 4.5.

Map 4.1: Map of the two neighbouring cities La Paz and El Alto



Blog "Imágenes de Bolivia" 2015.

Picture 4.1: El Alto, expanding into the Altiplano (towards the left); on the right, the beginning of the *hoyada* - La Paz

Blog "Imágenes de Bolivia" 2015.

Beyond the heated debate about the accuracy of the official data, two facts emerged from these figures:

1. The remarkable population growth in the major cities of Bolivia. The main urban centres are the favourite destinations of internal migration. Although international migration has become a widespread phenomenon, with people from the Northern Highlands leaving mainly for Argentina and Brazil (INE 2013), La Paz and El Alto remain the main magnets for the migrants of this area, followed by Cochabamba and Santa Cruz. Data have also revealed that Bolivia has become a predominantly urban country, as most citizens live in centres with more than 2000 inhabitants (Bolivia: Decreto Supremo No 1672, 31 de julio de 2013; Candela 2013; Heins 2011).
2. The impressive development of El Alto, due to both migration from rural areas and natural increase. In recent times El Alto, which gained autonomy from La Paz in 1988, has received a huge inflow of Aymara people from the surrounding rural areas of the Northern Altiplano. This rapid, yet unordered, urbanisation has indeed caused the emergence of issues such as poverty, congestion, pollution and the growth of the informal sector. According to Arbona and Kohl, the informal sector, since the 1970s, has shifted from resource extraction and manufacturing to commerce and services (Arbona & Kohl 2004). The teeming of people (workers, commuters, vendors) and of means of transport of every kind is what struck me the most when I first visited El Alto,

(Fieldnotes 21/28-08-2012; 4.4). El Alto's expansion potential is virtually unlimited, as the city has already grown significantly and can extend itself further to include neighbouring rural areas and indigenous communities. In section 4.4 I discuss the growth of El Alto and the development of a *desakota* region in more detail.

4.2.2 Deagrarianisation and transformation of rural livelihoods

Deagrarianisation and the diversification and progressive urbanisation of rural livelihoods can both be observed in the Altiplano Norte. A series of events, which correspond, to a great extent, to those composing Rigg's rural transformation picture (Rigg 2006), are occurring in the Titicaca region. I present the information I gathered in Coromata, Cachilaya and Okola, according to the eight "points of transformation" defining the "broad direction of change" identified by Rigg (p.183).

1) Occupations and livelihoods in the countryside are diversifying;
2) Occupational multiplicity is becoming more common and more pronounced;
3) The balance of household income is shifting from farm to non-farm;
4) Livelihoods and poverty are becoming de-linked from land (and from farming);
5) Lives are becoming more mobile and livelihoods correspondingly delocalized;
6) Remittances are playing a growing role in rural household incomes;
7) The average age of farmers is rising;
8) Cultural and social changes are being implicated in livelihood modifications (and in new ways).

In Cachilaya, Coromata and Okola occupations and livelihoods were indeed diverse (1). In a rural setting where agriculture had always been the predominant livelihood of all households, it was common to find families that lived on a mixture of different farm and non-farm livelihoods, and whose members performed a range of different activities each (2; 3).
In the same household it was possible to have

- people who had never lived in any other place but their community of origin;
- permanent migrants, who - depending on their place of destination - were more or less likely to be *residentes*;
- temporary migrants, who spent some periods of the year in the city or in the rural areas of other municipalities, to raise their income while there was little to do in their own plots.

The family of Don Juan, a 35 year-old farmer of Coromata, was an example of this situation. Through participatory observation (Fieldnotes 09/10-2012), and the data collected through structured interviews and a focus group (03-12-2012), I was able to retrace the migration history of this family. All members, with the exception of Juan's mother, had experienced migration. The father, 71, lived in the community, but before retiring he used to live in La Paz, where he was a politician. Juan's four brothers and sisters lived and worked in El Alto with their spouses and children. They frequently visited Coromata to celebrate festivities together with their parents and siblings and to participate in sowing and harvesting activities. Sometimes they brought gifts from the city and if necessary they supported their parents with some money. Juan was an exception in his family. He had not got married and he lived between his village, La Paz or El Alto, and the Yungas, the tropical transition region between the Cordillera and the lowlands. He worked his family's land with his parents during the crucial moments of the crop year, but when his help was not needed he would go to the city for some temporary job, or to the tropics for harvesting coffee, coca and citruses, to increase his monetary income. It was not difficult to come across families like Juan's in the Altiplano.

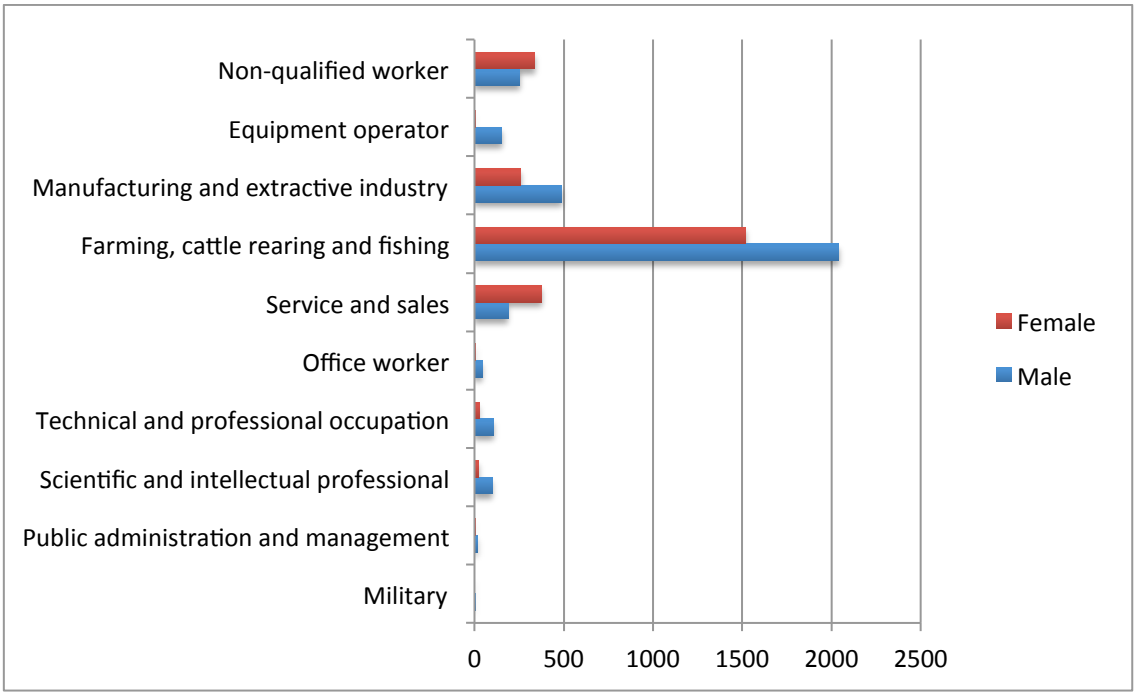
It would be incorrect to say that due to multiple livelihoods subsistence agriculture was not predominant in the Altiplano Norte. During my time in Cachilaya and Coromata I could observe that most people consumed what they grew and purchased only a few products (mostly vegetables, rice and bread) in markets (Fieldnotes 23-01-2013; semi-structured interviews). Nevertheless, it was extremely common for farmers to rely not only on agriculture as a source of sustenance, but also on other - increasingly non-farm - livelihoods (4). By looking at workforce distribution in the municipality of Batallas, where Cachilaya is located, it is possible to notice that while farming, cattle rearing and fishing are by far the most widespread livelihoods, people in Batallas are active in a range of other non-agricultural sectors. Of these, non-qualified work, service and sales, and manufacturing and extractive industry appear to be the most common. Women are largely active in these sectors. Particualrly, they are more numerous than men in the second and third.

This is indicative of the emergence of a "new rurality", which, as Kay summarises, consists of the following occurrences - all of them observable in the rural areas of the Altiplano Norte.

a) The shift to rural non-farm activities;
b) The increasing flexibilization and feminization of rural work;
c) The growing rural-urban interactions;

d) The rising importance of [international] migration and remittances (Kay 2008, p.923).

Graph 4.1: Workforce distribution in the municipality Batallas



Own elaboration using the data from the PDM Batallas 2011.

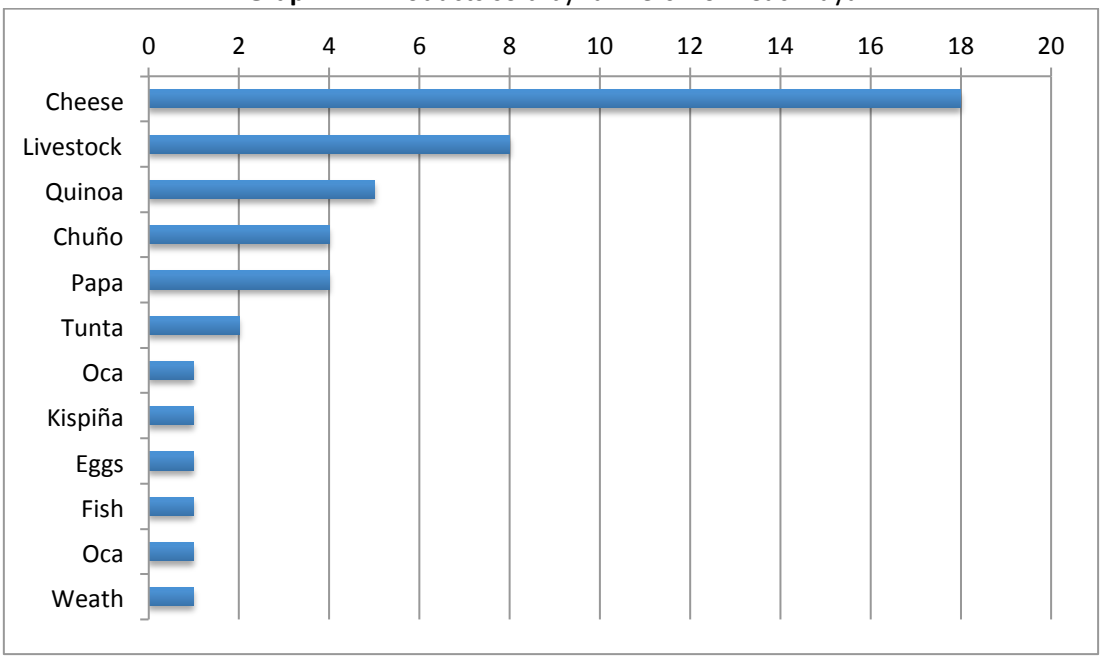
Firstly, in the Altiplano Norte the propensity of farmers to sell both agricultural products and manufactured goods has increased. It has never been unusual for Aymara farmers to occasionally sell or barter products at the community level or in local fairs (Focus groups Cachilaya 20-02; Coromata 18-03-2013; interview with UMSA researcher 04-12-2012). However, some farmers today sell cheese, quinoa, *chuño*, *tunta*, or livestock on a regular basis, (graphs 4.1 and 4.2) aided by improved communication (i.e. mobile phones and radio) and transportation connections. They do so either through intermediaries - who link private companies or bigger vendors with Altiplano smallholders - or in markets (i.e. in rural *ferias* or in La Paz or El Alto). "*Le doy el queso a un conocido. Él lo lleva al puesto de un comerciante en la feria de El Alto que lo vende. Lo llamo por teléfono cuando necesite vender*" ("I give the cheese to a person I know. He brings it to a vendor in the *feria de El Alto* who sells it. I call him on the phone when I need to sell my cheese" - Augustina from Cachilaya). In Cachilaya, I could also observe on several occasions the activity of buyers from Peru, arriving by boat to the community to purchase - at a cheaper price than in their home country - farmers' pigs for dealers on the other side of the lake. Their presence had been increasing (Fieldnotes and interview with a Cachilaya farmer 30-01-2013). Furthermore, markets are at the centre of the Altiplano's economic life. In 1985, a study from the Fernand Braudel Institute of World

Economics already spoke of a "market fever" and a "frenzied proliferation of market activity", particularly in El Alto (p.9). Migration from the Altiplano and the growth of El Alto between the 1950s and the 1980s are connected, according to Gall, with "the liberation of peasant mobility and the diversification of peasant economic activity since the agrarian reform that followed the 1952 Revolution". In this period, "land redistribution and subdivision, combined with accelerated growth of rural population that doubled overall densities on the *altiplano* between 1950 and 1980, aggravated the chronic minifundia problem"[36] (p.8). This pushed peasants to migrate, encouraged by the cheap price of land in the area of El Alto and, later on in the 1980s, by the decline of the mining business. With the rapid urbanisation of indigenous farmers and miners a number of "village-type" markets started to "flood the city, hungrily occupying" - in both La Paz and El Alto - "every open ground or sidewalk where goods (could) be spread out and the movement of pedestrians offer(ed) a chance for sale" (p.9). These markets have reached sometimes the size and the importance of established urban fairs[37] (Gall 1985). Petty commerce and *ferias* have become a distinctive characteristic of life in the Altiplano, both in urban and in rural areas.

Aymara farmers take advantage of the opportunities offered to them by this lively informal economy, and try to increase their monetary income by selling what they produce. A number of people, especially women, sell textiles or garments. In Cachilaya I became acquainted with a young mother who used to spend all the time she could spare from agricultural tasks and family duties knitting woollen hats that she would sell for 35 Bs.[38] each in the bi-weekly fair of El Alto. Her impressive rapidity at knitting and the lucrative business she had started thanks to her skill would raise the admiration of the other women of the community. She would knit while chatting with people or attending community meetings, eager to produce every day as many hats as possible (Fieldnotes and interview 23-01-2013). Also other women in Cachilaya and Coromata were often busy weaving or knitting to sell shawls and quilts to shopkeepers or in urban fairs (Fieldnotes 23/25-01-2015). While their husbands work in the city, women engage in agriculture for their family's subsistence, and in parallel become increasingly involved, as Kay underlines, in rural non-farm activities - mainly linked with retail trade.

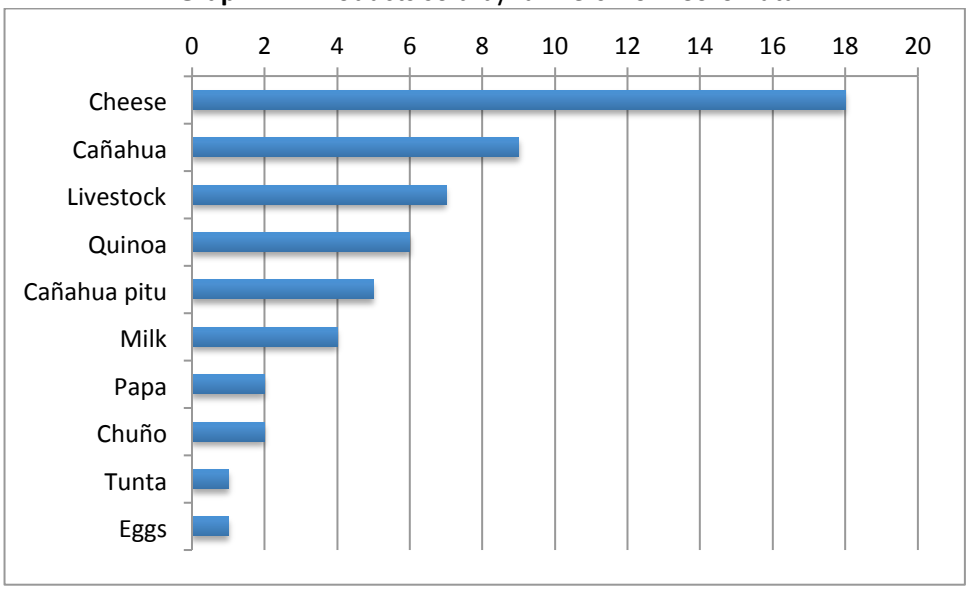
[36] The minifundia problem (or land fragmentation) is explained in section 4.2.3.
[37] Like in the case of the market of the *Gran Poder* area in La Paz, or the *feria 16 de Julio* in El Alto.
[38] According to ExchangeRates.co.uk, in 2012 the average rate for British Pound (GBP) to Bolivian Boliviano (BOB) was 0.0889. Bs. stand for Bolivianos.

Graph 4.1: Products sold by farmers from Cachilaya



Own elaboration based on survey data.

Graph 4.2: Products sold by farmers from Coromata



Own elaboration based on survey data.

Migration is extremely common in the Altiplano. In Cachilaya, Coromata and Okola, 51 out of the 64 households I surveyed had experienced migration (199 out of 334 household members). Migration involved 45% of the surveyed families in Cachilaya, 63% in Coromata, and 69% in Okola. Only three of the households untouched by migration had more than three members. Otherwise, all family units immune to migration were composed of two or three people - either a very old couple or a very young family with a baby. Migrants were mostly families with

middle-aged parents and adult children. Migration involved mainly people in their productive age.

According to the organisation PROFIN - offering insurance services against climatic risk to farmers on *papa* plots - in the *campaña de afiliación* (registration campaign) 2012/2013 it was difficult for many of the farmers who signed an insurance contract to name a *suplente* (substitute/guarantor). In a number of instances - because of migration - farmers did not have any family members in the community. Those who wished to get insured often had to sign as each other's *suplentes* (Interview with PROFIN staff member 23-01-2013; Fieldnotes 25-01-2013).

The data presented so far show how lives in the Altiplano Norte villages have become extremely mobile over the last decades. Today many people participate or have participated in internal and international migration, work temporarily in places different than their community of origin, and travel frequently to urban and rural areas within and outside the department of La Paz (5). An important role is played by transportation facilities. Connections between rural communities and the main urban centres are relatively frequent and affordable. From Cachilaya, Coromata and Okola it was possible, if necessary, to embark on a round-trip journey to La Paz on one single day. Fares were convenient. For instance, the price to travel from El Alto to Cachilaya, the rural community that - among the three - was closer to La Paz-El Alto, was of about 8 Bs. (6 Bs. from La Ceja, El Alto, to the town of Batallas, and about 2 Bs. from Batallas to Cachilaya). The duration of the journey could vary from one to two hours, depending mostly on the traffic in El Alto (Fieldnotes 15-11-2012).

Cheap and rapid transportation made it easy for temporary and permanent migrants who lived and worked in La Paz or El Alto to return to their community often and for their relatives and friends to visit them in the city. As I show below (4.4; 6.3), the number of the *residentes* living between rural and urban areas has grown exponentially in recent times.

A result of migration is the increase in the average age of indigenous communities' population (7). The fact that mainly elderly people lived in rural communities, while youth moved to the cities is a commonplace that emerged frequently in the conversations I had in both urban and rural areas (Fieldnotes 13-08; 08-12-2012).

Farmers themselves, who witnessed the departure of a large number of young people every year and the progressive ageing of the remaining community inhabitants, were concerned about their villages "disappearing". "*Puros viejitos se quedan aquí*" would say Don Alfonso ("Only elderly people stay here", Focus group Cachilaya 26-09-2012), while Doña Martha, a

young unmarried woman who lived in Cachilaya with her parents, would protest about old people remaining alone when their children moved to El Alto (Fieldnotes 25-01-2012).

In order to get a sense of the intensity and the size of migration and of rural depopulation, it is useful to look at kindergarten and primary school enrolment, whose trend confirms the overall perception. According to the research conducted by the agronomist Eliseo Mamani in Cariquina Grande, *provincia* Camacho, children attending primary school in this community were about 20 in 2012, while they used to be on average 80 during the 1990s (Fieldnotes 13-08-2012). During our stay in Okola, my research assistants and I could notice the disparity between the number of small children and the number of older students in the school. Every day during our stay in the community we were there at the beginning of the school day, when students arriving from their houses gathered in the open space in front of the main building and stood in tidy lines according to their class, while they sang the national anthem and listened to the director's daily speech. The group of kindergarten children, between 4 and 6 years old, standing all together in a line despite their very young age, was tiny if compared with the ranks of older students. There were on average between three and five kindergarten children, as opposed to about 10/12 students in each class for the grades third, fourth and fifth (Fieldnotes 04-2013). Although this could have been partly due to the reluctance of parents to send their younger children to school or to reasons linked with health issues, it can also be considered as indicative of the gradually decreasing presence of young families with children in the community. We were able to corroborate the observations generating this reflection by interviewing the farmers who hosted us in the village. Our informants reported that very few young people remained in Okola after completing secondary education. We could confirm them even further by discussing with teenagers their plans for the future. I explain this below in greater detail (6.4.2). In Cachilaya too farmers would often complain about the number of births in the village decreasing year after year. Some reported that in 2012 only 7 children had enrolled in the community's kindergarten, which municipal authorities threatened to close if enrolment remained so low (Fieldnotes 26-09-2012; 20-02-2013). As the PDM of Batallas says, between 2005 and 2010 the portion of children attending primary school declined from 86.51% to 65.36%, while secondary school students went from 67,01% to 54,69%. This was due to rural-urban migration and to the large presence of *residentes* families, whose children did not go to school in the community (PDM Batallas 2011).

Remittances played an important role in numerous families (6). It was rather infrequent, as compared to the size of migration, that money was regularly sent to villages of origin from La Paz and El Alto (in Cachilaya, Coromata and Okola only 10.7% of farmers received money from

migrant family members - Survey data). Migrants indeed helped friends and relatives in case of emergencies such as health problems or crop failure. Normally, however, they supported their families with gifts, mainly consumer goods.

"*Los hijos que viven en la ciudad traen fruta o pan como regalito. No traen dinero o por lo menos nunca he escuchado eso en la comunidad*".
"The children who live in the city bring fruit or bread as a present for their parents. They don't bring any money or at least I've never heard anything like this in the community" (Doña Juana, Coromata, 03-12-2012).

"My son brings me fruit, sugar and pasta from Santa Cruz. […] No, he never gives me any money; he's got his family to take care of" (Don Alfonso, Cachilaya, 30-01-2013).

"*While we are sitting in the garden, the daughter of Don Miguel and Doña Roxana arrives by car. She and her daughter are going to take care of us while her parents are busy preparing the funeral wake*[39]*. She's brought two large bags full of* marraquetas[40] *from El Alto. Don Miguel had told me that this is everything they get from their daughter*" (Fieldnotes, Okola, 18-04-2013).

It was more common for international migrants to send remittances to Bolivia in support of family members. I was explained that sometimes parents, in hopes that their children would benefit from good education opportunities and a better lifestyle, migrated to Brazil or Argentina to save money that they either sent home or brought back themselves at the end of their period of work abroad (Fieldnotes 14-08-2012).
According to my analysis, based on conversations with indigenous farmers, the discriminatory factor in the regularity and the amount of remittances was, however, not the place of destination, but the age of the migrants, their family situation, and the push and pull factors that had determined their choice to migrate. Young migrants, who left rural areas in search of more comfortable and wealthy conditions after completing school, tended to create for themselves a new life in the city, where they started their own family. They kept a strong tie with their community of origin. Nevertheless, their propensity to remit to their parents was low, unless exceptional circumstances, like those mentioned above, brought them to provide

[39] During my stay in Okola together with the Irfoss team an elderly community member passed away. He was a close friend of my hosts.
[40] *Marraquetas* are the typical *paceño* rolls.

their family with regular support. In contrast, migrants who decided to leave their village of origin at a slightly older age, after forming a family of their own, generally did so to improve the social and economic situation of their children. These migrants often chose destinations in other countries because there, despite the initial hardship, they could earn a higher income in a shorter period of time.

Independent of these considerations, it is important to emphasise that remittances have started to be part of rural families' income. In the framework of deagrarianisation, they often take other forms than monetary flows. The so-called social remittances are as important as economic ones. As Levitt argues, social remittances entail "the diffusion of various types of social practices, ideas and values, mainly to migrant-sending areas, which accompany the migration process" (Goldring 2004, p.805; Levitt 1998; 7.2.2). In the Bolivian Altiplano Norte practices and behaviours are reshaped while people move from rural to urban and from urban to rural areas (8), and new identities emerge (4.5).

To conclude this section, I would like to introduce briefly the quite exceptional case of Okola, where the process of transformation and urbanisation of rural livelihoods and the advent of a "new rurality" has taken the special form of community agro-tourism.

In Okola - since 2006 - a group of about 20 families has become involved in agro-tourism. Each family has different functions and duties, depending on their specific possibilities and wealth, and on the spare time that individual household members can dedicate to tourism-related activities. Some families host tourists - mostly foreign people - in their homes, which they enlarged and renovated for this purpose; some are in charge of cooking; some offer threading or pottery workshops and guided walks; some provide transportation services between Okola and La Paz or other tourist attractions (Fieldnotes and interviews with Okola farmers 01/04-2013).

As a farmer from this community declared, tourism has brought important changes to the families that decided to participate in this initiative. Those who joined the association ASITURSO - the *Asociación Integral de Turismo Santiago de Okola "Dragón Dormido"*, managing community tourism - are benefitting from this activity mainly from an economic point of view, as revenues generated by tourism are very high for rural standards (Interview with Doña Victoria 21-04-2013). At the time of my fieldwork, sleeping in Okola, hosted by a local family, cost 50 Bs. a night per person; having a meal 20 Bs. on average; participating in a workshop 40 Bs. This money went to the farmers and it was for the most part shared amongst ASITURSO members, according to the role covered by each one during the tourists' stay. A smaller fraction was used for collective initiatives for the benefit of the whole village (generally

it was given to the community's school for the maintenance of infrastructure or the purchase of school materials).

While staying in Okola, it was evident for my research assistants and me that livelihoods in the village still included farming as the main activity performed by community members. However, while agriculture was valued for subsistence reasons, income-generating activities were almost exclusively non-farm and, given the special circumstances of this community, increasingly connected with tourism (Fieldnotes and interviews with Okola farmers 04-2013).

Several farmers informed us that the whole population of the village was affected by the transformation generated by tourism with positive changes regarding the improvement of people's overall wellbeing and the implementation of investments in infrastructure and education. According to the *de facto* management of the initiative[41], the community had also acquired importance at the municipal level, because it attracted significant media attention and economic gains (Fieldnotes 31-10; 01-11-2012). The other side of the coin, however, was that rivalry and conflicts had increased within the community and between Okola and other centres of the same *municipio*, as a consequence of the social disparities generated by tourism. Until that moment, the initiative had involved only a restricted number of families, which participated actively in tourism-related activities and were, therefore, the primary beneficiaries. The project, though, affected a larger territory than the area surrounding the houses of ASITURSO members, and exploited the same resources that other people and villages drew upon[42] (more information about ASITURSO farmers' economic conditions, investments in Okola, conflict and advertisement of the agro-tourism project is presented in 6.4.4 and 7.3.1).

Okola could be considered a practical exemplification of Kay's argument that "new rurality", which manifests in this case with a lucrative non-agricultural (although agriculture-related) business, often benefits disproportionately those peasants who are already well-endowed with natural resources and human and social capital (Kay 2008). *Okoleño* pioneers - the first to adhere to the agro-tourism initiative - were return migrants. As I learnt from the tour operator active in Okola, these people, when the project was launched, could already rely on more abundant resources than the other families, more free time - being for the majority retired, an open attitude to visitors, and a business-oriented mentality thanks to their experience as urban migrants (Fieldnotes 24-01-2013).

[41] The association ASITURSO was represented in official meetings and coordinated in practice by an 86 year-old farmer, supported by some NGOs and tour operators - partners of the agro-tourism initiative.

[42] There were some tensions between Okola and the neighbouring community Quillima. The inhabitants of Quillima complained about *okoleños* (inhabitants of Okola) exploiting and damaging the territory where they also lived, to attract and receive tourists, without sharing the benefits of this activity with them (Fieldnotes 24 January 2013).

The transformation of livelihoods in Okola goes hand in hand with past, but also with present rural-urban migration. In the intentions of its creators and current leadership community tourism should limit it. However, migration has not decreased since its launch. We observed some weak signs of an inversion (two younger families had recently joined ASITURSO and two older couples had returned to participate in community tourism). Nevertheless, the majority of young people we spoke to wished to leave their village, just like in the rest of the Titicaca region. 22 out of the 24 school children we worked with declared that after their diploma they were planning to go to work in La Paz/El Alto, becoming *profesionales* by continuing to study or learning a trade. Only two stated openly that they wished to remain in Okola to work as farmers, and just one was thinking to get involved in the community agro-tourism project[43] (Focus group with schoolchildren 04-2013; 6.4.2). The case of Okola is further discussed in 7.3.

The evidence presented in this section traces a picture of gradual but radical transformation of livelihoods, lifestyle and needs in the Altiplano rural villages. As it is evident from the applicability of Rigg's analysis, the changes occurring in Northern Highlands region respond largely to the same dynamics generating similar transformations in other parts of the world. In the Altiplano Norte, however, these changes occur according to some typically Andean peculiarities, as sections 4.4 and 4.5 will clarify.

4.2.3 The causes and consequences of migration according to the Altiplano farmers

Overall, farmers described migration as a relatively new phenomenon, which involved rural people, particularly youth. They considered it to be potentially dangerous for agriculture and their villages.

Firstly, they worried that, with fewer workers available for farming, plots would be abandoned. The concern of many is summarised in the words of Don Miguel, who, while looking at his plots, complained about him being alone in Cachilaya with his wife and his two younger daughters, while his sons had migrated to La Paz. "*Cuando ya no pueda trabajar, nadie va a trabajar aquí"* ("When I am no longer able to work, no one is going to work here", 26-09-2012) he said, voicing the concern of numerous other elderly farmers of the region.

Furthermore, they reported that migrant community members participated less in collective decision-making and community management. As a consequence of depopulation, public resources (for the purchase of seeds, machinery, livestock and for infrastructure investments)

[43] More in 6.4.2.

were assigned to other more populous municipalities in fulfilment of their needs (Fieldnotes 03-03-2012). I discuss both aspects in chapter 6.

Despite this scenario, most Altiplano farmers I interacted with considered migration as a matter of fact, irrespective of their past experiences and current situation. In Cachilaya, Coromata and Okola I spoke with people who had never left their village, with temporary and permanent migrants and with returnees alike. Farmers were eager to engage in conversations about migrants' choice of a destination, life projects pursued by specific community members who migrated, or the relationship maintained by migrants with their community of origin. These topics seemed to be part of everyday conversation in the communities. The decision itself of leaving, however, was not normally questioned or discussed. "*No sé qué va a pasar en el futuro. Esto es lo que está pasando. Los jóvenes siempre se han ido. En todas partes del sector estamos en esta situación*" - ("I don't know what's going to happen in the future. This is what is happening now. Young people have always left. It is the same in the whole region", Don Alfonso, Cachilaya, 26-09-2012). This shows how deeply migration was embedded in the rural Altiplano way of living.

When farmers, in interviews, were encouraged to embrace a broad perspective on migration, going beyond specific personal or family circumstances, and invited to reflect on the reasons of this phenomenon affecting their whole community, they did identify some general causes.
Firstly, they mentioned young people's loss of interest in agriculture. On one hand, there were material obstacles to the pursuit of a condition of prosperity and wealth in rural areas. On the other hand, elderly farmers accused young people of being unwilling to lead a life of sacrifice and dedication to their crops for a good harvest, when other possibilities were available for them. "*Produce poquito*" (there is little production), farmers would say, "*produce pequeño*" ("it gives small products" - generally referred to tubers). Such statements testify to the fact that in the Altiplano yields are unpredictable because of possible crop failure, and production is often low due to the use of over-exploited seeds and to land degradation (Cachilaya 09-2012). Also, in the eyes of farmers, farming was strenuous, and unstable production made it a risky business. Furthermore, the problem of land fragmentation ("*fraccionamiento de parcelas*" - Urioste F. De C., 2003) made it difficult for young families to obtain a satisfactory production from their plots. The mechanism of inheritance in place in Bolivian rural areas entails that land is divided amongst siblings when parents die. Generation after generation the size of plots decreases. This, together with the overall limited quantity of land that each family owns, was responsible, according to farmers, for land overexploitation to keep production at a decent

level. In the past, plots were left to lie fallow for 7 to 10 years. Nowadays this is no longer possible, and land rests for a maximum of two or three years. This makes the soil even less productive (Focus group Cachilaya 26-09-2012).

Life in the Altiplano is notoriously harsh. This is why, farmers would say, Aymara people are strong and resistant. Working the hard soil under the burning sun of the day and making crops survive the intense cold of the night requires physical efforts and sacrifice, as well as a solid basis of knowledge and expertise. Young people no longer want to endure these conditions "*Los jóvenes ya no saben trabajar […] entran al colegio y cuando salen son flojos. Van a La Paz, no quieren trabajar duro*" ("Young people are no longer used to working the land. They go to school and by the time they get their diploma they have turned lazy. They go to La Paz, they don't want to work hard"). "*Los jóvenes ya no quieren aguantar, la vida aquí es dura*" complained Don Pascual confessing that - hadn't he had any children and the obligation to take care of his old parents - he would have also moved to La Paz ("Young people don't want to put up with this anymore, here life is hard", Cachilaya, 26-09-2012).

It emerged from unstructured and semi-structured interviews with farmers that this loss of interest is connected with the increasing appeal of urban customs. Farmers emphasised the desire of young men and women to earn a monetary income, become wealthier and buy commodity goods. Migrants are attracted by the urban living conditions, comforts, and opportunities. "*Los jóvenes quieren vivir cómodos. Quieren comprar cosas… quieren auto, celular*" ("Young people want to have a comfortable life. They want to buy things… they want a car, a mobile phone", 15-11-2012). "*[Los jóvenes] quieren comer mejor, vestir mejor, comer las cosas de la ciudad. Prefieren ir a trabajar*" ("Young people want to eat better, dress better, eat the city's food. They prefer to have a job in the city", 03-12-2012).

Cities, particularly El Alto and La Paz, offer numerous opportunities for migrants. Most of them find an employment as construction workers, tailors, and sellers of petty commodities. Those who have personal connections with urban dwellers, rural people who already spent a longer period in the city, or more often second-generation migrants, work as minibus drivers. Bolivians who cross national borders in search of better job opportunities generally become employed as wage workers in the construction and the textile sectors. They must endure harsh living conditions, especially at the beginning of their migration experience, but their sacrifices are largely rewarded by exceptional earnings, by far superior to domestic standards (Interviews with Cachilaya farmers 01-2013).

According to farmers, climate change was another stimulus for migrants. Unpredictable precipitation made agricultural revenues unsure, and extreme weather events, which - farmers and scientists agreed - had become more frequent, generated uncertainty and were deleterious for vulnerable families.

"*Aquí ya no se puede vivir bien. El lago ya no es el mismo. Ya no hay peces. Antes habían pescadores, pero ya no se puede pescar*" ("Here it's not possible to live well anymore. The lake is not the same. There isn't any fish now. Before there were fishermen, but now we can't fish any longer", Don Francisco 03-10-2012).

"*A veces llueve mucho. El año pasado el agua del lago subió hasta el camino. […] Es dificil decir la cosecha como será*" - "Sometimes it rains a lot. Last year the water of the lake went up to the road. […] It's hard to tell how the harvest is going to be" (farmer from Cachilaya 27-02-2013).

"*A farmer tells me this story - 'The climate is changing and it rains less. There was a bad year. It wasn't raining so we sowed late. The drought ruined the harvest. Since this happened, people have started to migrate more. My two sons went to Brazil. They work as tailors there. They never go back to the community and I haven't seen them in many years'. He also has two daughters, who are also away. He says they aren't interested in returning to the community*" (Fieldnotes 19-09-2016).

In Cachilaya, some middle-aged men identified a heavy drought that hit in 2000 as the origin of an intensified rural-urban movement. They said that, although migration was already occurring, the drought, which destroyed that year's harvest, pushed many to seek their fortune in urban areas, to grant sustenance to themselves and their families. This event was regarded by those who remembered it as a milestone in the village's history. Other farmers and scientists, however, mentioned some long periods of drought during the 1980s as the cause of a series of bad harvests, and of out-migration (Fieldnotes 25-01-2013). This is confirmed by the literature. Arbona & Kohl (2004) include El-Niño-related droughts of 1982-1983 amongst the factors at the origin of migration from the Altiplano to El Alto. This critical reading of the phenomenon of out-migration shows that - unlike most farmers - some fairly young and more reflexive people do analyse the phenomenon of migration in the attempt to identify possible causes. Nevertheless, it remains impossible to pinpoint the moment in which rural-urban migration began, with reference to environmental or climatic events, due to the diversity of farmers'

interpretations and responses, and the objective lack of a specific occurrence that was decisive enough to abruptly cause such an important shift. In a rural context it is not surprising that climate events are given emphasis, as they contribute to the definition of a condition of either prosperity or enduring precariousness for smallholder producers. Several farmers, as well as an expert from the organisation PROFIN, mentioned migration as one of the most common coping strategies adopted in rural areas after negative climate events or bad harvests (Focus group Cachilaya 26-09-2012; Interview with PROFIN staff member 23-01-2013). Indeed migration has always been an option for Aymara people in moments of crisis. However, as explained above, it has turned into a widespread and massive phenomenon since the 1950s, when the urbanisation and deagrarianisation processes began on a large scale. Today the consequences of climate change further fuel these trends, contributing to farmers' decision to migrate.

The factors indicated by Aymara farmers as the causes of migration in the Titicaca region can be positioned within the broader picture of livelihood transformation. Once again, as in Rigg (2006), there is a general tendency for rural families to rely increasingly on a range of different livelihoods, which are no longer mere "add-ons to the main business of farming" (p.181). Some "propelling forces" - like those identified by Rigg - are responsible for this transformation, occurring overall in the Global South. These are:

- The erosion of the profitability and returns to small-holder agricultural production;
- The emergence of new opportunities in the non-farm sector, both local and non-local;
- Environmental degradation;
- Increasing land shortages;
- Cultural and social change (Rigg 2006, p.187).

According to the farmers themselves, similar forces (and climate change on top of them) generate rural-urban migration in the Altiplano Norte, as discussed above. Like in other developing countries, this is part of a gradual shift away from agriculture and of an "urbanisation trend" (Gall 1985).

4.3 Decision-making at the household level

4.3.1 Migration yes or no? A choice that must fit in families' strategies

"*In the Altiplano Norte it is a saying that farmers' children, when they grow up, become '*profesores, militares o policía*' (teachers, soldiers or policemen). They generally study for this purpose. This is a very frequent escape from the community*" (Fieldnotes, unstructured interview with a PROINPA staff member 15-08-2012).

Choosing migration is common amongst youth. A study from PROINPA shows that the tendency among young Aymara people is indeed to abandon their village after completing secondary education to either work in the city (as carpenters, shoemakers, teachers, policemen, housemaids), study, or do the military service. They are pulled by the possibility of earning money and of enjoying urban comforts, and pushed by the desire to abandon the struggles of subsistence agriculture. It is unlikely, nowadays, that youth return to their place of origin permanently in their adulthood, after leaving for the city and starting a new family there (PROINPA, "*Carpetas socioeconómicas*" 2006).

Furthermore, the choice to migrate concretely depends on the migrant family's situation. Individuals must come to terms with the specific circumstances that might prevent them from leaving their home: the lack of siblings who take care of parents and family's land; health problems that they or their family members suffer from; special personal issues such as, for instance, being engaged or married with someone who has different commitments and plans. María, the youngest daughter of an Okola farmer, was sure that she would not leave the countryside after obtaining her diploma because she had to help her mother - alone due to migration of all other family members - with agriculture and agro-tourism activities (Interview 04-2013). Alfonso had not migrated when he was younger and he lived in Cachilaya with his wife and children because his parents were old and no one would have sowed and harvested in the family's plots had he not stayed (Interview 01-2013).

Decisions concerning migration are taken at the household level, according to each family's strategy and to the needs and desires of individual members. As in Lee (1966), at the micro scale, migrants evaluate their options, costs, risks and opportunities, influenced by "push" and "pull" factors.

4.3.2 Migration where and how? A decision based on opportunities and connections

The choice of a specific migration pattern is influenced by similar factors. Don Carlos, for example, who lived in Coromata, had worked on and off in La Paz and El Alto for several years, to increase his family's income after his first four children were born, and to pay for some expensive medical treatments for his son, who fell ill and then died in 2009. The particular situation of his family had induced him to opt for temporary jobs in the city, instead of a permanent employment that would have forced him to abandon his wife and children for longer periods (Interview 15-11-2012).

The farmers of Cachilaya and Coromata confirmed that the destination of migrants was determined by their own preference, the availability of convenient opportunities, and the presence of relatives or community members in the place they choose. Migrants' networks were of crucial importance. However, a distinction must be made depending on the place of destination that is taken into consideration.

For example, migrating to La Paz or El Alto requires a relatively limited investment at the family level. Travelling to these cities from the Altiplano rural communities is fast and cheap (4.4). Newcomers can rely on friends or relatives to assist them at the beginning of their stay. Furthermore, migrants who move permanently to the city do not generally find themselves facing a completely unknown reality. Connections between rural and urban areas are frequent and new permanent migrants, when they arrive in the city, have already, most of the time, travelled to La Paz and El Alto and spent some short periods of time there to attend fairs, visit relatives or friends, or perform occasional jobs. Information about job or housing opportunities can be accessed easily throughout the whole region. The main channels of transmission are temporary migrants, *residentes* or permanent migrants that farmers are in contact with. I could repeatedly observe during my fieldwork that scientists and NGOs ended up being important intermediaries in this sense too (Fieldnotes 14-11 and 25-10-2012).

On the contrary, migration to areas further away from the Altiplano villages, including international migration, leads migrants to places they have never had contacts with before. This type of migration relies heavily on migrants' networks. According to the data I gathered by interviewing farmers in Cachilaya, Coromata and Okola, those who moved to other countries chose a specific destination because of the presence of a family member, generally an aunt or an uncle, who could help them economically by contributing to paying travel expenses, accommodate them at the beginning of their stay, and support them in their job search.

Table 4.1: Migration destinations and patterns in order of frequency with which they are chosen

Destination	**Migration pattern**
La Paz/El Alto	Permanent
La Paz/El Alto	Temporary
Cochabamba/Santa Cruz	Permanent
Argentina/Brazil	Permanent
Los Yungas	Temporary

Own elaboration based on survey data.

The choice of a destination is strictly linked with specific patterns of temporary or permanent migration. According to my survey data (Table 4.1), permanent migration to La Paz and El Alto is the most common type of migration in the Altiplano Norte, although it can sometimes take a temporary form depending on specific needs and circumstances. The second most frequent destinations are the other two major cities of Bolivia, Cochabamba or Santa Cruz. These places, which are further away from the Northern Highlands' communities, make migration permanent. International migration follows. This tends to be a long (sometimes life-long) experience for those involved. Finally, there is migration to Los Yungas. Migrants who go there work for a wage in plantations in specific moments of the tropical crop year (i.e. harvest time), which require labour-intensive activities such as picking citrus, coffee or coca. Migration to Los Yungas is by its nature temporary and seasonal.

4.3.3 Migrants' relationship with their community of origin

Depending on the specific destination and on the duration of the migration experience, migrants' relationship with their family and community of origin develops according to different degrees of intensity. International migration, because of long distances and high travel costs, interrupts migrants' physical contact with their communities of origin completely for long periods of time. Several elderly farmers from Cachilaya, for example, had not seen their children - migrants in Brazil or Argentina - in years. Phone contacts were easy, though infrequent. Many migrants who lived in Santa Cruz had almost entirely lost contact with their community of origin, although they returned more often to the Altiplano. In the case of Cochabamba, instead, migrants maintained rather regular contacts with their village by paying and receiving occasional visits to/from family members. Nevertheless, they were not factored

into the strategy of their family of origin, as they were considered absent and unavailable (Interviews with Cachilaya farmers 25-01-2013).

By interacting with Cachilaya and Coromata farmers, I understood that seasonal migration to Los Yungas allowed temporary migrants to participate actively in community life, agriculture and family activities. Migration was restricted to specific periods of the year (between sowing and harvest times and after the harvest in the Altiplano, when farming was on hold in the highlands and labour was required in the tropics). Farmers choosing this type of migration, although not present for a few weeks during the year, were in all respects full members of their community and their families relied on them for performing agriculture and other livelihood activities.

When migration is directed to La Paz and El Alto, migrants maintain a close relationship with their family and their village. This relationship and the strong connections that exist between farmers and urban dwellers contribute to the formation of a *desakota* region.

4.4 La Paz-El Alto and the Altiplano Norte as part of a *desakota* region

The administrative capital of Bolivia, La Paz, and its neighbouring autonomous extension, El Alto, are the main poles of attraction for migration coming from the Altiplano Norte. La Paz has drawn rural migration since colonial times. The city's core has progressively expanded, particularly during the 19th and 20th century. However, due to its peculiar location and geography, the intense waves of migration arriving since the 1950s could not be entirely absorbed by the *hoyada*, and the urban centre begun to spread in the plateau above La Paz. There, with the construction of the airport and the establishment of several factories, a new settlement entirely composed by migrants appeared (Arbona & Kohl 2004).

El Alto, which used to be an area of La Paz, has grown at an impressive rate since becoming autonomous. The fast-paced physical expansion of this city was extremely clear to me while travelling from the La Paz to Lake Titicaca. To reach the recently built *autopista*, the single lane motorway that goes to Copacabana, vehicles had to extricate themselves from the overcrowded streets of the older area of El Alto, where the first conglomeration of migrants settled (La Ceja). Here urban markets, like the *Feria 16 de Julio* - defined by Lonely Planet travel books as the biggest urban fair of South America - take place, occupying a vast area with stalls and generating tremendous traffic jams. Then, they had to cross the more recent neighbourhoods, currently characterised by the same population density of La Ceja (Fieldnotes 12/20-09-2012).

"*Along the way, two abandoned tollbooths can be noticed, one in the area Río Seco and one further ahead along the way in a place called* Ex Tranca *("former tollbooth bar"). In different years, these two points used to mark the end of El Alto and the beginning of the* autopista*, where drivers would pay their toll when leaving the city. One after the other they were swallowed by houses and buildings. The tollbooth has now been moved further away, in an attempt to place a longer distance between the urban area and the beginning of the countryside. Nevertheless, along the few kilometres that separate the higher density residential zone from the current tollbooth, on both sides of the road, the so-called* urbanizaciones *are seen, new rather poor and precarious settlements signalled with a name or a number, mushrooming in the no longer empty space between the rural and the urban*" (20-09-2012).

Besides the increasing physical proximity caused by rapid urbanisation, numerous connections between the rural and the urban exist. This leads to an increasing overlapping of these two dimensions in both contexts.

1) Multiple languages

El Alto, also called the "indigenous city", is mainly inhabited by native people (Lazar 2008). There, because rural-urban migration from the Altiplano has been the main feeder of El Alto's urbanisation, Aymara is spoken widely. Although most people speak Castellano, many have not forgotten their native language. During my frequent visits to El Alto, I could hear people, especially the elderly or women, speak in Aymara with each other. I was explained by *residentes* in Cachilaya and Coromata that the dominant language in urban public spaces was Castellano, which made migrants' children gradually unlearn their parents' language. However, Aymara was largely in use in El Alto homes (02-2013). Conversely, as a result of frequent rural-urban connections, migration, telecommunication and an improved education system, all young people in rural villages spoke Spanish, as well as most adult men and some women (09-2012).

I realised, while travelling on public transport to fieldwork sites, that minibus drivers taking passengers from El Alto to the Altiplano rural communities were often migrants coming from the very village they travelled to for work, or from another village of the same area. They spoke Spanish with passengers while working. It was not unusual, though, that they interacted in Aymara with passenger friends or relatives going to the countryside. They would welcome them on-board, reserve seats or wait for them to arrive before leaving; chat in this language with the *cholitas* (women dressed in the traditional indigenous way) who climbed on the bus

with their huge bundles on their shoulders. Often, these women could not understand Spanish and approached drivers directly in Aymara (Fieldnotes 15-11-2012).

2) Frequent trips between La Paz/El Alto and rural communities

The impressive number of minibuses swarming daily between indigenous communities of the Titicaca region and the city demonstrates that people travel in both directions continuously. When I used public transportation to travel to the rural Altiplano communities, I always sat on buses packed with urban migrants or farmers who had gone to the city for buying food and commodities from markets. I travelled often between 8 and 10 a.m. At that particular time of the day it was normal to sit next to Aymara women with huge *aguayos* - the typical indigenous pieces of cloth characterised by bright colours and a striped pattern - stuffed with goods bought early in the morning in urban *ferias*. With the same frequency I bumped into migrants living in El Alto and travelling to their community of origin for a visit, relatives of migrants who were going to the city to see their family members, and farmers who had gone shopping in La Paz or El Alto (Fieldnotes 11-2012).

3) Strong relation of urban migrants with their community of origin

In interviews *pobladores*[44] and *residentes* of rural communities informed me that Aymara migrants from the Titicaca region who move to La Paz or El Alto travel to their native village often. They do so at the occasion of festivities (i.e. *Todos Santos* in November, *Carnaval* in February), and to help their family with the sowing and the harvesting work. Visits can be more frequent in case of special circumstances or if villages are very close to El Alto. It is common that parents assign a portion of the family's land in the community to migrant children: a small plot or a few furrows in a bigger one. By sowing crops here migrants can rely on a yearly production of food that guarantees a nutritional basis for their family. They mostly sow *papa*, the number one staple in the Andean diet, easily transportable and ready to eat after cooking, and with potentially high yields for a relatively small quantity of land (6.4.1). Although potato is available in markets, it is rare that first and second generation migrants from the Altiplano buy it from there. Instead, they bring *papa* from their community of origin, saving a considerable amount of money throughout the year.

To illustrate, Doña Delfina's daughter, who lived in El Alto, was often in Okola with her mother, who had remained alone after her husband had passed away and her children had migrated.

[44] Non-migrant farmers, who rely on agriculture for their subsistence all year long.

Doña Delfina could not walk properly, but she took care of herself and her family's plots. Furthermore, she often hosted tourists in her house on the shore of the lake. During the harvest season, however, her daughter, who had a two year-old baby and did not work full-time in La Paz, would spend several days in a row in her mother's house in Okola to help her with agricultural activities and foreign tourists. She would leave the village with her *aguayo* full with *papa* and other freshly harvested tubers for her family (Fieldnotes 04-2013).

4) The "*residentes*"

Permanent migrants who live in the city but maintain a house and land in their community of origin are called *residentes*. Although they live somewhere else, they are still officially part of the community, as their name is included in the list of *comunarios*. They are taken into account when resources are distributed and when collective land is assigned. In addition, they can become community authorities or members of the *junta escolar* (school's committee). Community authorities remain in charge for one year so, if *residentes* get elected, they have the duty, during this period of time, to travel back to their community every time there is a public function or a meeting.

In March 2013, on the minibus, during a trip to Okola I met Doña Rosmery, an Aymara 60 year-old woman grown up in this community. Doña Rosmery had migrated to El Alto with her husband when she was young. Her children, all *profesionales*, were born in the city. Rosmery and her husband were *residentes* in Okola. In 2013 they were chosen as a household to take on the role of community authority. Rosmery explained to me how husband and wife were trying to share the "burden", as Rosmery called it, of being assigned this role by taking turns for attending the mandatory monthly meetings, according to their specific individual commitments (Fieldnotes 21-03-2013). Like Rosmery, many people who felt a strong attachment with their community of origin and wished to keep their land there, chose to be *residentes*, despite the fact that this came with a series of obligations that it was not always easy to fulfil. I explain in the next chapter how *residentes* shape their community's life strongly with their presence and absence and with their "urban mentality".

By interacting with them in the field, I learnt that PROFIN and PROINPA scientists deemed the increasing number of *residentes* responsible for the unexpected demographic data that emerged from the 2012 census (Interviews 05-2013). Many *residentes*, they said, despite being permanent migrants living steadily in the city, had decided to travel to their community of origin for the census. They wanted to be registered as inhabitants of their rural village because of 1) their sense of belonging; 2) pressure from family and community members, concerned

about a disadvantageous allocation of public resources to the village; 3) fear of being dispossessed of their land. According to an indigenous community practice, all land that is not used properly can be reassigned to other farmers of the community. Concerns about *residentes* being surveyed in the place where they normally lived were voiced repeatedly by farmers too (Fieldnotes, Coromata 10-2012).

In November 2012 I participated as an observer to the *Taller Abierto de Preparación al Censo Nacional de Población y Vivienda 2012*, organised in Yanacachi, Los Yungas, by the *Fundación Pueblo*. Attendees were extremely worried about public funds assigned to Yanacachi for the construction of new water pipelines being hijacked towards more populous centres of the region if the census showed a demographic drop in the village. Despite the reassurances of the coordinators of the workshop and the experts from INE about the anonymity of the census and the purely statistical purpose of the survey, attendees decided - at the end of the *Taller* - that it was better if migrants returned to their hometown on the day of the census (Fieldnotes 04-11-2012).

The return of *residentes* to their villages for the census shows their attachment to their community of origin, their interest in the future of their village, and their strong connection with their family and with the other community members. However, it also shows that - most likely - large numbers of *residentes* were surveyed as living in rural rather than urban areas.

5) Return migration

While engaging with farmers in rural communities, return migration struck me as a common pattern among those who had settled in La Paz and El Alto in their youth. In Cachilaya, Coromata and Okola it was frequent to find couples of *residentes*, who - after maintaining their house and land in the countryside for years - had moved back to the Altiplano leaving their children and grandchildren in the city.

The characteristics of return migration in Okola are particularly interesting to analyse (7.3). In this community there was a large number of return migrants, most of whom had decided to become involved in community agro-tourism. As mentioned above, the first members of ASITURSO were a group of farsighted farmers who, after living and working in El Alto or La Paz for many years, went back to Okola when they retired. ASITURSO relied primarily on households composed of elderly couples of return migrants (Fieldnotes 04-2013).

Several of them believed that their urban experience had helped them to understand better the potential of their community and of agro-tourism (Interviews 04/05-2013). The staff from the travel agency working with ASITURSO were sure that return migrants had a stronger entrepreneurial attitude in comparison with the other *okoleños* (Fieldnotes 24-01-2013).

6) The presence of urban-based NGOs in rural areas

During my fieldwork I observed how rural-urban connections were also created and reinforced by NGOs and research organisations. Overall, these operated widely in the Altiplano, where external interventions were proliferating[45]. In my fieldwork sites I could myself see that NGOs and private philanthropic institutions were active in a range of different sectors (agriculture, healthcare, education, water and sanitation). Although different in scope and approach, they all ended up strengthening the relationships between the rural and the urban spheres. Their activities multiplied the physical contacts of farmers with urban dwellers and with the city itself. On one hand, urban-based development workers or scientists frequently visited rural communities; on the other hand, farmers involved in conservation or development projects attended meetings and workshops in the city or NGOs' headquarters. Furthermore, while taking indigenous traditions and practices into great consideration, NGOs' initiatives often embraced a market-based approach, transmitted to the farmers along with a typically urban mentality. Community agro-tourism is an example of this (6.4.2; 7.3.1). Although implemented in respect of and according to the Aymara rural lifestyle, this project induced farmers to increase their familiarity with money, urban buyers and selling opportunities, international tourists and researchers.

Based on the evidence presented in the points 1 to 6 above, I argue that - given the range of connections between the rural and the urban areas of the Altipano Norte - not only the physical but also the ideal proximity between rural and urban areas is increasing in this region. According to McGee, since "urban activities defined as non-agricultural activities are spreading into areas that have previously been defined as rural" (McGee 2009, p.1), it is necessary to rethink the two categories of rural and urban. In many areas of the world the rural-urban divide has turned into a mere "ideational" separation (Jones 1997, p.248). *In situ* urbanisation often takes place in rural areas (Zhu 1999). Entire regions, according to Jones, are not defined as urban, but their population - because of employment, ease of transport and communication - lives in a close relationship with urban areas. Zhu et al. point out, with reference to *in situ* urbanisation in China, how the distinction between rural and urban areas is blurry (Zhu et al.

[45] Unlike remote communities of the Cordillera (i.e. some of the communities involved in the "*Chirapaq Ñan* Initiative" - interviews 08-2013), where NGOs were beginning to work in 2013, in Coromata, Cachilaya and Okola different projects had been implemented by NGOs and research centres during several decades. Some of them ran in parallel in the same villages.

2009) when rural settlements and their populations become urban or quasi-urban without any significant relocation of their residents (Zhu 2004).

I argue that in the Northern Altiplano the distinction between rural and urban areas is real and physically evident. However, a process of *in situ* urbanisation is indeed in place in the countryside, as it grows more and more connected with the city. In parallel, the urban area of La Paz and El Alto is expanding and, while some formerly rural communities end up being absorbed by the urban, other farther away villages - though maintaining most of their rural characteristics - gravitate increasingly towards the city. Livelihoods are also transformed, as explained in the previous sections. I find this passage from Gall's description of the Bolivian Altiplano perfectly fitting. "Nowhere", he states, "is this city-village fusion more dramatically articulated" (p.9). While the economic culture of the village invades urban areas, "city becomes village; village becomes city" (p.4) with an overall shrinking of differences (Gall 1985).

Table 4.2: "Designating rural-ness (tradition) and urban-ness (modernity)"

	Traditional/rural-ness	Modern/urban-ness
Production and livelihoods	Subsistence-oriented	Negligible subsistence activity
	Agriculture-focused	Predominantly non-agricultural
	Singular, relatively unstratified economy	Diverse, stratified economy
	'Simple' lives with few consumer goods	Cash intense and consumer good-rich
Social and physical interactions	Informal, personal interaction linked to seniority	Formal interaction based on hierarchies linked to wealth and political power
	Relatively immobile	Relatively mobile
	A world unto itself	A place where integration and interaction are intense
	Long khaek (mutual cooperation) is the basis for village activities	Cash-based activities define work and labour relations
	Attachment to the village	Alienation from the village
Identity	Peasant, *luuk baan nok*	Post-peasant, worker
	Backward-looking, ignorant, uneducated, lacking motivation	Forward-looking, aware of the world, sophisticated, disciplined, educated

Rigg et al. 2008, p.380.

Rigg et al. reflect on table 4.2, prepared by drawing on the discussion of Thompson about the reshaping of "rural-ness" and "urban-ness" in Malaysia, due to the transformation of some typically rural realities (i.e. the *kampung*, villages) into new ones presenting urban

characteristics (Thompson 2004; Thompson 2002; Thompson 2003). According to Rigg et al., in some areas of the developing world the places where people reside tend to no longer coincide with their livelihoods. Due to a series of factors including rural-urban migration and increased connectedness between the two realities, many people in the rural area lose some of the characteristics listed in the left column of the table and take up some of those listed in the right one. During my fieldwork in the Altiplano Norte I noticed that most Aymara farmers presented indeed the typical features of "rural-ness". However, their lifestyle and livelihoods were increasingly shifted towards those marking "urban-ness", making the virtual space between the two columns acquire importance.

To sum up, based on the evidence I gathered, I can conclude that most of the events observable in the Altiplano Norte today are typical of a *desakota* region. As Hyman argues, these are emerging throughout Latin America, as a consequence of the following occurrences:

- The development of a dense and improved transportation network;
- The use of information and communication technologies that reduce space and time distances between rural and urban areas;
- An intense rural-urban migration, which creates a new link between the urban areas and the rural areas that migrants leave behind;
- The return of remittances to rural areas;
- An overall increase in opportunities for wage labour;
- The growth of services and industry connected with agriculture;
- A drop in the proportion of labour allocated to agriculture (Hyman et al. 2000).

4.5 The *cholo-mestizo* mentality and lifestyle

To conclude this chapter, I focus on what distinguishes the Altiplano Norte from other regions with *desakota* characteristics. Analysing the typical traits of the new urban dwellers and their lifestyle is crucial to understand the phenomenon of rural-urban migration in this area, the connections that indigenous migrants maintain with communities of origin, and the changes that occur in the rural Altiplano as part of a broader process of transformation. Reflecting on what "rural-ness" and "urban-ness" entail in the specific Altiplano Norte context is useful to comprehend the nature of these changes in depth.

To begin, a premise is necessary. It is important to point out that urban indigenous migrants are the new prominent characters of an economic dynamism that has characterised the development of the Altiplano in recent decades. According to the literature, these people are at the centre of the rapid expansion of a special form of market economy, which is, on one hand, based on the capitalist principles of consumerism and wealth accumulation, but, on the other hand, ruled and shaped by typically indigenous traditions and practices (Tassi 2010). Tassi calls them *cholo-mestizos,* merging two terms that are commonly used in the Altiplano Norte. *Cholo* (feminine *chola*) is how the Bolivian white elites have historically referred, with a pejorative connotation, to indigenous urban dwellers - people with rural origins, who settled in the city wishing to improve their economic conditions. Today the term *cholo/a* is commonly used by the rural and the urban indigenous people of the Altiplano themselves (picture 4.2)[46]. In this work it is adopted without any negative connotation to distinguish urban indigenous people from *mestizos*.

The term *mestizo* has indicated since colonial times someone who is mixed between Spanish and native American. Today it is applied more broadly to the people who, despite their indigenous roots, have merged with the *criollo*[47] world and are fully urbanised. While *mestizos* have adopted the white elites' habits and customs, *cholos*, on the contrary, keep strong ties with the rural indigenous life and culture (Tassi 2010). Despite this difference underlined by Tassi, the terms *cholo* and *mestizo* are often used with a similar meaning, to summarise the final result of the process of urbanisation involving rural indigenous people. Hudson and Hanratty (1989), for example, argue that "the transition from Indian to *cholo* or *mestizo* require(s) at least a change in residence. By migrating to an urban area, an Indian might assimilate and become thoroughly *mestizo* in aspirations and identity. Assuming *mestizo* identity require(s) not only a change in style of clothing and livelihood but also sufficient facility in Spanish to speak with a locally acceptable accent. Complete assimilation (is) difficult to accomplish in one generation, however. More typically, the migrant's children (come) to

[46] Women, in particular, are affectionately called *cholitas*, a term used to indicate all women of indigenous origin, who wear traditional clothes. Authors like Weismantel (2001), however, argue that the term *cholo/a* - although commonly used - is not devoid of a negative connotation. In fact, she states, it "often functions as a synonym [of *indio*], uttered with all the vitriol that could ever be attached to [this] word […]. For hatred is often there, perhaps more visible is the fact that *indio* and its synonims are almost never heard alone. The most common phrase in which the word appears is *indio sucio* ("dirty Indian"); indeed the very concept of an Indian is strongly associated with dirt and disease" (p.XXXIV-XXXV). Alongside such forms of contempt and discrimination, which have existed since colonial times, reverse mechanisms are also there. As Weismantel reminds us, by quoting Abercrombie (1998, p.46) indigenous peoples "denigrate whites as *q'aras*" (p.XXXVII), a category which embraces the white elite and - by association - also the *gringos* (the foreigners, including Latin American non-indigenous visitors).

[47] *Criollo* means creole, and in this context it indicates a person with European descent who was born in Bolivia.

consider themselves *mestizos* or *cholos* as they (are) educated and (become) adapted to urban ways" (Hudson & Hanratty 1989).

Picture 4.2: "*Volverías conmigo chola*" ("Would you come back to me *chola*"), a romantic message in the streets of La Paz

La Paz 28-01-2013.

Given its history and demographic composition, Bolivia has inherited, despite its colonial past, a strong indigenous identity. A large portion of the population is of indigenous ethnicity, and indigenous traditions, languages, foods and practices pervade society and lifestyle in rural as well as in urban areas. In 2001, 62% of the citizens aged 15 and over declared to be indigenous, according to the results of the National Census (INE 2001). Particularly since the election of president Evo Morales in 2005 and the approval of a new Constitution in 2009, indigenous peoples have acquired confidence, reaching the forefront of the national government's agenda (Wessendorf 2011; 2.3).

In 2012 the results of the census showed an apparent trend reversal, as 69% of Bolivians declared that they do not belong to any of the 36 indigenous groups listed in the Constitution. About 2,806,592 people in the country self-declared as indigenous (La Razón Digital 2013). Nevertheless, this new statistical picture was a surprising outcome both for the Bolivian population and for the government, especially given the 2 million population increase since the previous census (INE 2013). This result was ascribed to the flawed conduct of the census. Furthermore, it was also regarded by many as a defeat for Evo Morales, an "indigenous president for an indigenous nation" (Pretel 2014). The decision of the government to exclude from the census questionnaire the option "*mestizo*" was also criticised heavily. According to

many of the urban Bolivians that I interacted with during my fieldwork, a large number of citizens would have ticked this box, had they been given the opportunity to do so, due to the increasing number of rural-urban migrants and of inter-ethnic weddings (Fieldnotes 06-2013).
The indigenous identity is not being lost, but it is undergoing a transformation, as the space separating the rural and the urban dimensions becomes more narrow, and the boundaries between categories less defined. While cities receive peasant migration from the Aymara hinterland, they become ethnically and economically similar to rural centres (Gall 1985). *Cholos* can be placed in an intersection between different realities. As Soruco Sologruen emphasises, the *cholo*'s "presence dissolves the frontiers of (a) society of castes, he is neither completely *criollo* nor Indian, urban nor rural, western nor Andean, hegemonic nor subaltern" (Sologuren 2006). Evo Morales, despite himself, has been defined by the press as the "quintessence of the *indomestizo*" (Pretel 2014). Indeed, "he wears Western garments embellished with tribal motifs, he chews coca and he plays football, he preferred union militancy to the Inca *ayllu*, and he declares himself, at the same time, a follower of Túpac Katari[48] and a convinced Marxist-Leninist" (translated from Pretel 2014). Weismantel and Eisenman (1998) argue that "born Indian, untold numbers of Andean people have died as mestizos" since the conquest - showing how this phenomenon is not exclusive to the present generations. According to Pretel, (2014) who uses *cholo* and *mestizo* interchangeably, today a typical Bolivian *cholo-mestizo* can have an indigenous mother and a *cholo* father, be a catholic and worship the *Pachamama* at the same time. He probably had a rural childhood and decided to migrate to the city in his youth. He speaks Spanish, but with the typical grammatical constructions and accent that he inherited from his native language.

During my fieldwork in the Northern Highlands, the emergence of a *cholo-mestizo* culture was clear to me in both La Paz and El Alto.
While El Alto is almost entirely composed by Altiplano migrants, La Paz has a particular concentration of *cholo-mestizo* people in certain areas, where rural-urban migrants have settled in the last decades. Here second, third or even fourth generation migrants are retailers and shopkeepers, who run businesses and have sometimes reached a considerable level of social success and wealth. This condition was particularly evident to me in the occasion of the huge *fiestas* they organised in the northeastern districts of this city. I participated in two of these events, taking place in big *salones de fiesta* (reception rooms) of the areas *Garita de*

[48] Túpac Katari was an Aymara indigenous people's leader in their fight against Spanish colonialism in the 1780s. He is considered an indigenous hero and is extremely popular in Bolivia. One of the most famous and active indigenous movements in Bolivia is named after him - *katarismo*.

Lima and *Gran Poder*, where music played, alcohol flowed, and elegantly and richly dressed Aymara *paceños* danced and drank until late night (Fieldnotes 09/24-03-2013).

With the exception of people who rely on specific networks, new migrants generally move to El Alto. My survey data showed that this is the case for most migrants from Cachilaya, Coromata and Okola. Here the population is mostly composed of first or second generation migrants.

When people move to the city, indigenous rural behaviours and traditions are integrated into a new lifestyle, which ultimately does not correspond either to the lifestyle of white élites, or to the lifestyle of Aymara farmers. To clarify this I focus on two examples.

The first example concerns food. In particular, I describe 1) the main features of the rural diet; 2) the urban buying and eating habits of the white and *mestizo* upper middle class of La Paz; and 3) the *cholo-mestizo* consumption habits. During my fieldwork I shared meals with Aymara farmers almost daily in the communities where I worked. In rural areas meals were almost entirely vegetarian and based on tubers and grains, eggs and cheese produced by the same smallholders that consume them. As farmers themselves reported, they generally bought vegetables, rice and pasta in local markets. Meat was eaten rarely, for instance in the occasion of festivities when farmers slaughtered their own livestock, or exceptionally bought meat from the market (Fieldnotes 27-02-6; 11/13-03-2013). In rural areas pre-packaged foods and beverages coming from urban areas are increasingly available due to frequent connections with urban areas. People from Cachilaya, for example, bought them in the shops of larger rural towns or in the tiny community shop, while littering their village by disposing of plastic waste and bottles in the fields and on the Lake's shore.

While I was in La Paz, it was easy for me - as a foreigner[49] - to observe and experience the lifestyle of the white elite and the *mestizo* upper middle class. I could see that these people regularly consumed products of imported brands and packaged food, alongside fresh products bought in the market by themselves or by their *empleadas* in the case of particularly wealthy families. Agricultural products coming from the Altiplano, fish from the Lake Titicaca, tropical fruit, and meat from the Bolivian lowlands were equally present in their diet, given the wide

[49] Between November 2012 and September 2013 I rented a flat in downtown La Paz in a relatively wealthy neighbourhood. There, among the friends I used to spend most time with, there were a number of upper and middle class people, whose habits and preferences I could observe closely. Aside from the fact that many of these friendships were for me of invaluable human importance during my 14 months in Bolivia, I should point out that it was considered quite natural for me - as a foreign researcher - to mix with these people, who involved me in their lives with enthusiasm, hospitality and curiosity. At least initially, most of these relationships were possible thanks to my contacts with expats and local development workers.

availability of these products in markets. While typical Andean dishes were often consumed, foods of international origin were also popular in their homes. Supermarkets (from the chains Ketal and Hipermaxi), exclusive to upper middle class buyers, could be only found downtown in the richer neighbourhoods. Although for long neglected, products coming from *el campo* were also present on the tables of wealthy *paceños*', who considered them tasty and healthy (7.4.1).

During my tours of El Alto and certain neighbourhoods of La Paz I noticed that the *cholo-mestizo* diet was based on rice, pasta, bread, meat and Andean tubers. Grains were also present as the basic ingredients of soups and *refrescos* (for example, drinks made of maize and quinoa were often sold by street vendors). Meat was bought in markets and was widely present in *cholo-mestizo* meals, to the point that eating meat coould be regarded as a status symbol. As I was repeatedly told, a man who does not eat meat is not a man. Also women consumed their meat-based meals with voracity in street restaurants and kiosks. Every one of these food selling places in El Alto and in the *cholo-mestizo* areas of La Paz served daily dishes like fried or stewed chicken (*pollo frito* or *sajta de pollo*), stewed beef (*thimpu*) and fried pork (*chicharrón*). Meat was, however, always sided with *papa*, *chuño* or *tunta*, as well as with chopped tomato and onion. The *cholo-mestizo* predominantly bought groceries in open-air markets or in the little shops of their neighbourhood, where it was possible to find fruit and vegetables, fish, meat, eggs and cheese, as well as sacks of flour, sugar, pasta and rice sold *al por mayor* (wholesale). Alternatively, they brought tubers, grains, *chuño* and *tunta* from their communities of origin in the Altiplano. Packaged foods like snacks, industrially produced juices, soft drinks and alcoholic beverages, especially beer, were broadly consumed and could be easily found in urban shops and kiosks (Fieldnotes 05-10-2012; 27-03- 2013).
It is clear from this example that *cholo-mestizo* people have neither adjusted to the refined, expensive and Western-inspired habits of the white and *mestizo* upper middle class, nor have they maintained the typically rural customs of Aymara communities after becoming urbanised. They have, on the contrary, developed their own new lifestyle that is widespread in El Alto and in entire areas of La Paz. Although they do regard the products coming from the Altiplano, widely consumed in urban dishes, as good, natural and tasty, they are big consumers of meat, tropical fruit, industrial foods, and alcoholic beverages.

The second example concerns women. In urban areas *cholo-mestizo* women are the maximum expression of the indigenous urban lifestyle, rooted in the rural Aymara tradition and transformed by the city's market economy and welfare ostentation. In El Alto it is possible to

bump into very recent migrants, who still live - both men and women - according to a typically rural lifestyle and have the same looks of Aymara farmers. On the contrary, in the older neighbourhoods of El Alto, surrounding La Ceja, and particularly in the Eastern slopes of La Paz basin, where migrants settled longer ago, the typical female figures are the so-called *cholitas paceñas*, women of Aymara origin who were born in the city. According to Weismantel (2001), in the Andes a "vicious binary of Indian and white" (XXXVIII) exists. This - she argues - "cannot be disguised by the use of the category *mestizo*. However, the *chola* fractures the binary racial system" (*Ibidem*)[50]. These women display a strict dress code, based on the indigenous rural customs, characterised by long skirts, shawls and bowler hats. As Llanque summarises, the urban version often adds to this rural Aymara uniform 1) make-up (picture 4.3); 2) the use of expensive cloths produced abroad or by Bolivian craftspeople, shoes and hats according to the moment's fashion, and embroidery; and 3) expensive jewellery (Llanque 2008). *Cholitas paceñas'* flamboyant outward look is complementary to their own and their family's economic welfare achieved in urban areas. As theorised by Hall, identity is "not an essentialist, but a strategic and positional one" (Hall & Du Gay 1996, p.3). Furthermore, it is not "singular, but multiply constructed across different, […] intersecting and (potentially) antagonistic discourses, practices and positions" (p.4). Wade (1997) underlines that the relational identities Latin American indigenous people are the result of a historical course. He argues that identity is "constructed through complex processes of relationality and representation; it is a process, not a thing, and is constantly under renegotiation" (p.81). Rural-urban migration plays a fundamental role in shaping this new identity, applicable to *cholitas paceñas,* emblematic characters of the *cholo-mestizo* world. As Llanque states, *cholitas paceñas* embody a "new social status" and they combine, produce and reproduce some indigenous peculiarities alongside modern ones. They are equally familiar with the rural and with the urban codes of conduct, and they use both rural and urban material goods (Llanque 2008).

The complex and "multiply constructed" identity of *cholitas paceñas* emerges from pictures 4.4 and 4.5. The first one shows a wrestling match between *cholitas* in El Alto that I attended on 31 March 2013. This form of entertainment, although recently become a tourist attraction, is extremely popular among *cholo-mestizo* families, who flock every Saturday to the Coliseo Multifuncional, where these events take place. As I witnessed, after an introductory match of male wrestlers and clowns, *cholitas* - the real stars - enter the boxing ring, acclaimed by the audience, wearing elegant traditional clothes. They remove their hat, earrings and shawl, as

[50] Weismantel, however, questions in her book whether the existence of mixed race categories like *cholo/a* or *mestizo* "really mitigate the effect of the white/nonwhite binary" (2001, p.XXXIX).

well as their first outer skirt, before the fight begins, and incite the crowd with insults and swearwords. In the ring *cholitas* must come across as strong and aggressive, shameless and vindictive. They are laughed at because of the caricatured representation of themselves that they offer. However, by their own admission, the main characteristics of *cholo-mestizo* women that *cholitas* themselves are proud of are indeed strength, determination, independence and sauciness, especially with the other sex (Fieldnotes 31-03-2013[51]). They are an icon of the current process of "massive social change", as the press calls it (Dear 2014), underway in Bolivia. The characteristics of *cholitas paceñas* contrast sharply with the traditional image of indigenous women - strong, but modest and shy. However, today women *del campo* (of the countryside) take inspiration from urban *cholitas*. Picture 4.5 displays the cover of the "*Cholita paceña*" calendar 2014, featuring twelve *cholita* models. In the calendar photographs, *cholitas* wear luxurious garments and jewellery from the most prestigious artisans and fashion designers of Bolivia that obtain some excellent publicity from this collaboration ("*Cholita paceña*" 2015).

Picture 4.3: Two cholitas paceñas during a *fiesta*

http://www.cholitapacena.com, 02-2015.

As Tassi argues, the increasing availability and exchange of consumer goods has allowed *cholo-mestizos* to develop an intense urban market economy through a successful model that

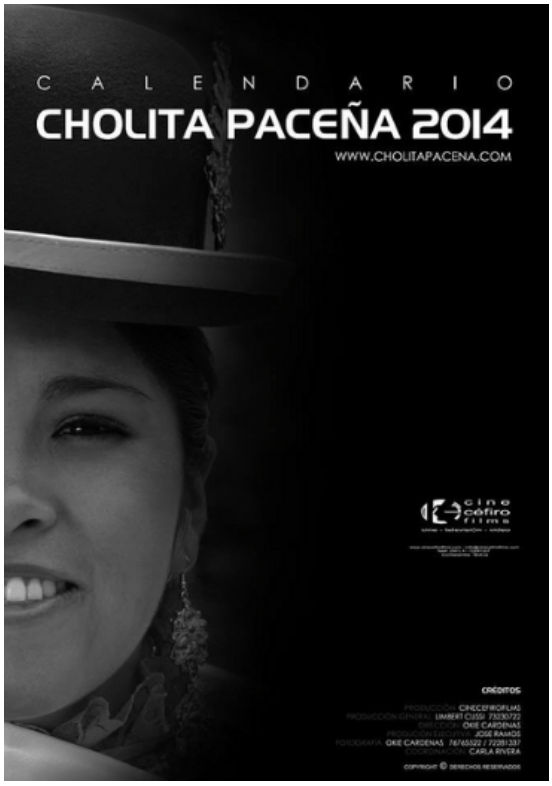
[51] On 31 March 2013 I supported the visual anthropologist, photographer and co-coordinator of the Irfoss workshop Riccardo Bononi in his data collection work before, during and after a *cholitas* wrestling match. I acted as co-interviewer and translator. The final result was his photographic reportage "*Las Valkyrias de Bolivia*", winner of the 2015 Sony World Photography Award in the "Sports" category, http://www.clickblog.it/post/138358/sony-world-photography-awards-2015-trionfo-dei-fotografi-italiani.

maintains strong connections with the indigenous sphere, its practices, beliefs and social networks (Tassi 2010). This is the result of a process that - since the conquest - has seen indigenous people (personifying the "traditional") become increasingly incorporated into the market economy (the "modern"). Indians have gradually entered and occupied the domain of the *mestizos*, "becoming *mestizos* themselves, perhaps via the intermediate category of the *cholo*" (Wade 1997, p.41). The connections with "the indigenous", however, are so deep that some typical Aymara rituals, which have partly lost momentum and intensity in rural communities becoming marginal social activities, have been redeemed and revived by *cholo-mestizos* in the urban context, where they have been turned into massive events. Thanks to their economic welfare and their fascination for extreme abundance, the *cholo-mestizo* population of La Paz, for instance, has taken over the organisation and the realisation of one of the most famous festivities of the Andes, the religious folkloric *Fiesta del Gran Poder* (Tassi 2010).

Picture 4.4: A *cholitas* wrestling show in El Alto (*Lucha libre de cholitas*)

Picture by Riccardo Bononi, El Alto 31-03-2013.

Picture 4.5: The *cholita paceña* calendar 2014



http://www.cholitapacena.com, 02-2015.

The presence of wealthy *cholo-mestizo* families in certain areas of La Paz and, particularly, El Alto, is recognisable through the typical *cholo* architecture of some recently constructed buildings (picture 4.6). In El Alto and in the slopes of the *hoyada* huge mansions with several storeys, characterised by the typical Andean shapes and bright colours, can be spotted amongst the less ostentatious brick houses. They are the result of the considerable investments of some richer indigenous urban dwellers, and their magnificence aims at showing the wealth and the abundance their owners live in.

I ascertained through unstructured and semi-structured interviews with Altiplano *pobladores* and *residents* that the *cholo-mestizo* lifestyle is what rural migrants aspire to when they move to the city (see 4.2.3, presentation of pull factors of farmers' migration).

"*They [the girls] laugh about my trousers. I ask them why they do it and they say that I look like a man. I am like those "men" who walk around in the city [they are referring ironically to downtown women who often wear trousers]. I tell them I like their skirts and ask them if they'd like to have trousers like mine. They wouldn't. […] They like their* cholitas *clothes*. *[…] Mariana and Paulina would like to live in La Paz when they finish high school*".

Young girls' desire is to continue to be *mujeres de pollera* (women who wear the traditional skirt, and along with it the rest of the traditional Aymara garments - interviews with three young women from Cachilaya 06-03-2013). However, just like men, they wish to acquire the wealth of *cholo-mestizo* people, their same access to comforts and urban foods, and the social prestige and visible success that some of them have reached. They aim at becoming part of the "*clase alta no burguesa*" (upper non-bourgeois class - Tassi 2010) that *cholo-mestizos* have formed.

Picture 4.6: The so-called "*cholets*", a definition that blends the words *cholo* and chalet

Blog Patchanka, http://blog.pachanka.org/post/87663297188/cholets, 02-2014.

As this section has illustrated, urban - namely *cholo-mestizo* - lifestyle and habits have a considerable influence on the rural world. Aymara rural youth have the *cholo-mestizo* lifestyle in mind when they leave their community to embark in the experience of migration. On one hand, *cholo-mestizo* habits and networks replicate those of the countryside in urban areas, and facilitate the integration of rural people in the cities' economic structure. Places like El Alto represent a "new young, syncretic and dynamic version of the urban Aymara culture" (Albó 2006, p.341). On the other hand, connections between urban dwellers and their rural relatives and communities of origin are valued on both sides because of attachment, as well as for

utility reasons (Tassi 2010). Rural communities are inevitably affected by the physical and ideal proximity of urban areas. In the city it is possible to make the “indigenous urban dream” come true: it is possible to join an environment that is traditional, yet modern, indigenous, yet based on an economic logic, and to increase wealth and prestige in a relatively short period of time without abandoning familiar customs.

5. On-farm agrobiodiversity conservation and use in a "new rurality"

5.1 Introduction

In this chapter I take indigenous communities as an observation point to analyse how agrobiodiversity conservation and use are like in the Altiplano Norte "new rurality" scenario. I start by explaining how the work of peasants, the protagonists of on-farm agrobiodiversity conservation around Lake Titicaca, has increasingly gained recognition at the international level and within Bolivia. Then, I examine 1) the current composition and distribution of seed diversity and relevant knowledge within Aymara villages; 2) the channels of transmission used today for genetic resources ("material flows") and agrobiodiversity-related information ("non-material flows" - Subedi et al. 2003); 3) the reasons that encourage farmers to conserve agricultural varieties today. While the tight connection between countryside and cities brings traditional practices to engage with more recently established dynamics, novel stimuli and mechanisms of seed and knowledge transmission appear, and roles and responsibilities are distributed within families and communities according to a combination of "old" and "new" circumstances.

In the second part of this chapter I contextualise Aymara farmers' conservation activities, by 1) comparing the characteristics of agricultural production in the Altiplano Norte with those in the Altiplano Sur; and 2) analysing the current institutional framework and rhetoric concerning on-farm agrobiodiversity conservation, native products and traditional foods in Bolivia. On one hand, the Altiplano Norte is a distinct and particular setting with reference to the conservation and the use of native crops and agricultural diversity. On the other hand, it is touched, just like the rest of the country, by a revival of indigenous crops, promoted by international organisations and by the government.

In this chapter I draw from both literature sources and primary data. I engage with academic publications concerning on-farm agrobiodiversity conservation in different areas of the world (i.e. Jarvis et al. 2011; Jarvis et al. 2000; Subedi et al. 2003; Sthapit et al. 2006; Amend et al. 2008). However, I also bring into the analysis empirical evidence from the secondary material I gathered through archival research during my fieldwork in Bolivia. For instance, I use the research work of the *Fundación* PROINPA and INIAF (i.e. Flores et al. 2014; Rojas et al. 2014; Rojas et al. 2010; INIAF 2012, 2014a; Iriarte, Condori, Parapo, & Acuña, 2009; Informes

SINRGEAA) of Bioversity International (i.e. Gruberg et al. 2013; Padulosi et al. 2011) and of the centres AGRUCO, PROSUCO and CIP - the *Centro Internacional de la Papa* (i.e. Delgado Burgoa & Escobar Vásquez 2009; Iriarte et al. 2009; Ugarte & Iriarte 2009; CIP & FEDECH 2006; García & Cadima 2003; Arbizu & Tapia 1992). In addition, and most importantly, I rely on the qualitative and quantitative data I collected in Cachilaya, Coromata and Okola through participant observation, unstructured and semi-structured interviews, focus groups, and a survey. In particular, the data presented in this chapter are the result of my interaction with indigenous farmers in their homes and - above all - their agricultural plots, and of my conversations with local and international scientists working in and on Bolivia. For example, I include in 5.6 some findings from a research on the Altiplano Sur conducted by Enrico Avitabile - an economist of the University "Roma Tre" that I repeatedly discussed with during my fieldwork. I also refer to the works of the UMSA researchers Vania Alarcon Vicente, Ruth Quispe Sequeiros and Eliseo Mamani Alvarez that I met and spoke with extensively in both the city and the rural villages; to publications from UPB - the *Universidad Privada Boliviana* (i.e. Birbuet & Machicado 2009) - where I participated in an event and in meetings together with the Irfoss students; UPEA - the *Universidad Pública de El Alto*, founded in 2000, (Ajata Rivera 2011); and the University of Padua, Italy (Torresin 2010).

5.2 Indigenous farmers: the protagonists of agrobiodiversity conservation

In Bolivia agrobiodiversity conservation is currently entrusted to a series of public and private bodies, whose activity is coordinated by INIAF (*Instituto Nacional de Innovación Agropecuaria y Forestal*)[52], and supported by international and national public and/or private funding. INIAF - in charge of promoting and managing the conservation of genetic resources at the national level - is at the heart of a network of research centres, genebanks and laboratories[53].

[52] INIAF was created on 25 June 2008 with a government decree, *Decreto Supremo* N.29611. Article 5 states that one of the functions of this institute is to form and manage the National System of Genetic Resources (*Sistema Nacional de Recursos Genéticos - SNRG*) that includes agricultural, livestock, aquatic and forest resources, germplasm banks and research centres. According to Law 144 of 2011, INIAF is "the body in charge of conserving and managing in situ or ex situ genetic resources of agrobiodiversity, wild relatives and micro-organisms, with the purpose of avoiding genetic erosion and ensuring the availability (of genetic resources) for agricultural and livestock production. The State will facilitate access to genetic resources for production and research purposes, in order to consolidate food sovereignty in the country, as long as their use occurs in compliance with the country's policies for the protection and defence of genetic resources" - translated from article 13, 4(a and b).

[53] INIAF is also responsible for running the main centre of research and conservation of the country, the *Estación Experimental Toralapa*. This centre, situated in the Tiraque municipality, Cochabamba, has been active since the '70s, and until recently its activity has been supervised by the Fundación PROINPA, in charge of the conservation of genetic resources in Bolivia between 1998 and 2009 (INIAF 2012). I visited Toralapa in April 2013 together with a group of "custodian farmers" from the Altiplano Norte.

On-farm conservation, once given little credit and considered ancillary to *ex situ* conservation, has gained importance in the framework of a process that reconfigured the scope of global conservation activities and the role of farmers in the developing world. While in the past systematic efforts undertaken to preserve genetic resources focused predominantly on *ex situ* conservation, more recently scientists have highlighted the benefits of *in situ*/on-farm practices, which designate indigenous small-scale farmers as true protagonists of the maintenance of agrobiodiversity in its hotspots[54].

Retracing briefly the recent history of agrobiodiversity conservation in Bolivia is useful to understand how this broader transformation took place. Between the 1950s and the 1970s, governments, in application of a Green Revolution-inspired approach, placed modernisation of production and productivity increase at the centre of the country's agricultural development agenda. This objective was pursued according to schemes diffused by Western countries (primarily the United States), which were based on technological innovation generated in research centres and laboratories and transmitted to producers according to a vertical structure. Scientific knowledge was reproduced according to a typically Western model, while other forms of knowledge were relegated to an inferior level. As a result, producers were mere receptors of a process that was entirely in the hands of scientists.

In the Andean area of Bolivia small-scale farmers struggled to keep up with the intensive production model that was promoted: their plots were too small; irrigation - required for production increase - was not possible because of climatic conditions and the lack of infrastructure; improved seeds, fertilisers, machinery etc., included in the technological packages that were sold, were too expensive (Delgado Burgoa & Escobar Vásquez 2009). Yet, they were indeed affected by the repeated attempts to modernise agriculture and establish a formal seed system. Today, the massive use of "modern varieties" (Subedi et al. 2003) - introduced by scientists mostly in the 1970s and 1980s (Winters et al. 2006; PAR & FAO 2011) - shows this clearly.

In 1975, when the *Instituto Boliviano de Tecnología Agropecuaria* (IBTA) was created[55], agricultural innovation - previously dominated by market forces - was taken under the control of the State. A vertical model of agricultural innovation was initially maintained, but it was

[54] The International Treaty on Plant Genetic Resources for Food and Agriculture, entered into force in 2004, states in article 9.1 that "the Contracting Parties recognize the enormous contribution that the local and indigenous communities and farmers of all regions of the world, particularly those in the centres of origin and crop diversity, have made and will continue to make for the conservation and development of plant genetic resources which constitute the basis of food and agriculture production throughout the world" (FAO 2009 - ITPGRFA).

[55] This institute closed in the 1990s and most of its activities and staff were incorporated by organisations like PROINPA, and later on by INIAF (Rojas et al. 2010).

gradually replaced by an approach that took indigenous knowledge and traditional production systems into higher consideration. Following a transformation of conservation strategies and practices promoted by international agencies, participation in innovation was given greater emphasis and many Bolivian organisations, previously involved in the top-down modernisation project, revised their mission (Delgado Burgoa & Escobar Vásquez 2009). PROINPA, for example, expanded its mainly technical and production-oriented vocation by adopting a vision of sustainable and participatory agricultural improvement (*PROINPA website* 2014). Indigenous small-scale farmers - whose efforts, for a long time, had been given little attention vis-à-vis "scientific" conservation practices - were gradually recognised as the "custodians" of agrobiodiversity conservation, and the importance of conserving genetic resources on farm was acknowledged. Today, in the Altiplano Norte, Aymara producers, who have performed - unnoticed to outsiders, throughout the centuries - conservation activities for their own survival, are granted broad recognition - on one hand, with a nominal acknowledgement of their role within the framework of a celebrative discourse, taking shape around native crops, and traditional diets and lifestyle; on the other, through a practical increase in nationally- or internationally-funded projects aimed at supporting them in their conservation work[56] (5.7.1).
In May 2014 a "Manifesto of Gratitude to Custodian Farmers of Agrobiodiversity" was signed in La Paz (7.2.4). While INIAF is forming the SNRG, including both an *ex situ* and an *in situ* component, the network of "custodian farmers" and their relevant Community Seed Banks[57] are being officially involved in it (INIAF 2014a). Through this institutional step, the Bolivian State recognises the importance of the contribution of indigenous smallholder farmers to a nationally and globally important effort (Flores et al. 2014; Rojas et al. 2014).

The scientific community agrees that the benefits of on-farm conservation "relate not only to genetic diversity but also to ecosystem health and human well-being" (Jarvis et al., 2000, p.2). Conservation performed by indigenous farmers preserves the processes of evolution and adaptation of crops in their environment; ensures the continuation of ecosystem services, such as the restriction of the spread of plant diseases; applies to the species, ecosystem and genetic intraspecific diversity levels; protects the livelihoods of resource-poor farmers through

[56] It should be noted that, however, some scientists still report that a disproportion (in favour of *ex situ* conservation) exists in the distribution of attention and resources between *in situ*/on-farm and *ex situ* (Flores et al. 2014).
[57] These concepts are explained in 5.4.1.

economic and social development[58]; maintains and increases farmers' control over and access to crop genetic resources (Jarvis et al. 2000).

Genetic diversity is affected by mutation, recombination, genetic drift and migration - namely gene flow (Subedi et al. 2003). According to Subedi et al., a series of elements determines it.

1) The exchange of seeds;
2) Socio-cultural preferences;
3) The needs of farming communities living in different circumstances; and
4) Farmers' selection.

The role of farmers in defining each one of these elements is obviously crucial. Agrobiodiversity conservation and use depend on the decisions taken year after year by farmers, and on the activities they perform in fields based on knowledge, practices, and use of genetic resources (Padulosi et al. 2011; Gruberg et al. 2013; Interview with a PROINPA staff member 12-09-2012).

5.3 Agrobiodiversity in Aymara smallholders' farms

5.3.1 Agricultural species and varieties in farmers' fields: the outcome of continuous adaptation

Agriculture and food systems are indicative of each region's environment and history. In the Altiplano Norte these reflect the transformations occurred since the appearance of agriculture in Latin America about 6000 to 8000 years ago (Tapia & Fries 2007), when indigenous people domesticated wild plants for the first time, by improving their productivity to suit their needs.

Today in the Central Andes farmers conserve a wide range of species and varieties in their plots. Due to the distinct altitudinal layers, environmental conditions, and types of soil, precipitation and exposure to frost and sunlight change within short distances. In order to grow food across a wide range of microenvironments and microclimates, indigenous peasants have domesticated and maintained a rich diversity of agricultural varieties. This could ensure their subsistence all year long, and protect them against crop failure (National Research Council Staff 1989). In the Altiplano Norte agrobiodiversity is a distinctive feature of agro-ecosystems.

[58] As Jarvis et al. (2000) argue, this is achieved thanks to an increased ecosystem health and, subsequently, crop production; the availability of new marketing opportunities; and the creation or maintenance of sustainable livelihoods through the implementation of development initiatives that rely on endogenous inputs (p.3).

Another characteristic of agriculture in this region is that native and externally introduced crops coexist. Native species have been and are at the basis of agriculture in the Americas: this shows that agriculture was not introduced by 15th century conquerors but, on the contrary, it was developed in an independent form, based on local species, before their arrival (Tapia & Fries 2007). The first contact between the Old World and the New World, indeed, made agriculture in the Americas undergo a radical change, as new plant and animal species were introduced from Eurasia and Africa. While numerous crops were acquired by Europeans and then spread to the rest of the world (potato, maize, beans, tomato, cotton, tobacco), many others (coffee, sugar cane, banana, oil palm) were brought to the Americas, reshaping landscapes, diets and agro-ecosystems. New livestock was also introduced and crops like oats and barley, used as fodder, displaced local species and altered the original ecological balance. Externally introduced species adapted to the Andean soil and climate, and today they are present in the Altiplano in a number of different varieties. Native ones, however, exist in a much greater diversity in farmers' plots.

The contact with the New World did not cause the only revolution within Andean agriculture. In the Bolivian Highlands agro-ecosystems' characteristics have changed repeatedly across the centuries. In La Paz, an agronomist from PROINPA explained to me how in the Altiplano Norte market pressures and technological innovation have reshaped the range of crop varieties conserved by Aymara farmers. Over the last 60 years - he told me - new varieties of native tubers and grains have been given to small-scale producers by Western and Bolivian scientists. These were improved varieties, often precocious or more resistant, introduced to increase production by contrasting adverse climatic conditions, pests and diseases (Interview 22-09-2012). During my fieldwork I could confirm - by observing agricultural practices and interacting with farmers through interviews - that numerous households in indigenous communities grow varieties introduced by scientists like *Jachagrano* and *Blanquita* (quinoa), or *Juliaca* and *Illimani* (cañahua). Also *Papa Huaycha* was obtained through participatory selection in the framework of a "seed improvement programme". This variety was fully integrated in the farming system of the whole Lake Titicaca region. It was the most produced and sold variety, as well as the most consumed in urban areas (Survey data; Fieldnotes 06-2013; 6.4.3; 5.4).

Table 5.1: Native and externally introduced crops in the Altiplano Norte

Native crops
1. Potato (*Solanum tuberosum*)
2. Oca (*Oxalis tuberosa*)
3. Isaño (*Tropaeolum tuberosum*)
4. Papalisa (*Ullucus tuberosum*)
5. Quinoa (*Chenopodium quinoa*)
6. Cañahua (*Chenopodium pallidicaule*)
7. Maize (*Zea mays*)
8. Tarwi (*Lupinus mutabilis*)
Externally introduced crops
1. Barley (*Hordeum vulgare*)
2. Oats (*Avena sativa*)
3. Broad bean (*Vicia faba*)
4. Pea (*Pisum sativum*)
5. Wheat (*Triticum sativum*)
6. Alfalfa (*Medicago sativa*)

Own elaboration based on data retrieved through participant observation and interviews with farmers and agronomists.

The main crops that small-scale farmers grow in the Altiplano Norte are listed in table 5.1. Although those are the species that I found in this region, indigenous people concentrated their production on particular combinations, according to specific soil and climatic conditions, the strategies established at the community level, and their individual preferences[59].

All three rural sites where I focused my research activities were "*microcentros de diversidad*" ("micro-centres of diversity"), located around communities of a small size, whose territory hosted a large diversity, both in agricultural plots - thanks to the conservation activity of indigenous farmers - and in the wild (PROINPA, Informes SINRGEAA; Rojas et al. 2010; Fieldnotes 09-2012). The three of them belonged to a region, surrounding Lake Titicaca, denominated (i.e. by De Candolle and Vavilov) the "cradle" of Andean roots and tubers (Iriarte et al. 2009). However, as explained in 2.2.2, they differed from each other because of altitude,

[59] It should be noted that farmers in the Altiplano Norte always grew several products in their plots in the framework of a mixed farming system. Based on my fieldwork data from rural areas, I can state that it is virtually impossible to find a farm that relies exclusively on one specific crop (the only exceptions could possibly be *residentes*, who - as I discuss extensively in chapter 6 - increasingly show a simplifying approach to agriculture). Besides farmers' intention to diversify consumption and distribute risk, what induced them to cultivate several crops was also the existence of both private and collectively owned land (as I illustrate in "*Agrobiodiversity conservation in an Aymara community: the collective dimension*" - 5.4). What to sow in collectively owned land was established at the community level according to crop rotation mechanisms.

proximity to Lake Titicaca, climatic conditions, vegetation and welfare of inhabitants. Agricultural production varied too. In order to help the reader contextualise my analysis, below I briefly explain what the agricultural production of Cachilaya, Coromata and Okola was like, and how farmers related to their crops.

Inter-specific diversity in the three rural fieldwork sites

In the whole Lake Titicaca region, including my three case studies, the tubers *papa*[60] and oca, and the grain quinoa were widespread and could be found in a broad range of varieties.

Papas have a high symbolic and material value for Northern Highlands' farmers. Eating *papa* every day and in every meal was considered by many as a habit of the poor[61]. During the numerous meals I shared with farmers in Coromata and Cachilaya, people would often apologise with me for not being able to offer me anything else but *papa* (Fieldnotes 01-2013). However, although farmers verbally degraded their main nutriment, this crop was given high consideration in rural villages for being the absolute staple in the Aymara diet[62]. In Bolivia, on average, each person consumes more than 100 kg of potato in a year. Urban dwellers eat about 80 kg, while rural farmers consume about 140 kg (Ugarte & Iriarte 2009). The production of *papa* is considered to be part of the cultural identity of Andean people - a popular saying in Andean Bolivia is "*ser más boliviano que la papa*", "to be more Bolivian than the potato".

Quinoa is a staple of the Aymara diet too. It is a source of vitamins, minerals and proteins. In rural communities farmers consumed it as grain - in soups, or as *pesque* (boiled quinoa generally with milk or cheese); otherwise as *pitu* - toasted refined flour, consumed with milk or water as a beverage, or used for the preparation of *kispiña* (steamed buns made with quinoa flour, limewater and salt - Fieldnotes 03/04/05-2013). Quinoa grains - farmers in Coromata explained to me - need to be washed before they are consumed. I learnt from PROINPA scientists that they contain saponin in the outer layers of their seed coat. As I could witness, indigenous women wash the grains by hand after the harvest to get rid of their "bitter taste".

[60] *Papa* is the local name given to potatoes in Spanish. The plural *papas* was often used, as different "families" exist.

[61] This is, according to the data I gathered and to my own analysis, a colonial legacy, as the example concerning quinoa, included in 5.7.1, shows in detail.

[62] In her 1988 book Weismantel discusses Andean people's relationship with the food they eat and/or see in markets with reference with their identity. Some of her considerations are applicable to the Bolivian Altiplano Norte context. For example, she states: "*…women making soup may occasionally express shame at not serving white rice instead […] but these experiences, though telling, are evanescent. It does not seem […] as though women see the glamor of the white world as seriously challenging the integrity of everyday indigenous doxa" […] "change does not necessarily imply the loss of cultural identity*" (Weismantel 1988, p.166). These reflections can be read in connection with the concept of "indigenous modernities" (chapter 7) and the existence of *cholo-mestizos* (chapter 4).

Doing this is hard and tedious, just like the grinding - necessary for the preparation of flour - which is another typically female task (Fieldnotes 04-12-2012; 19-04-2013).

Oca is another Andean tuber. Farmers explained to me during the sowing of a collective oca plot in Cachilaya that it is tolerant to harsh climates and requires less care than potato. However, its flesh can have an acid taste (19-10-2012). I could observe during the post-harvest phase that farmers placed tubers in the sun for a few days, to make the level of glucose increase. As a result, oca "*soleada*" had a sweet taste. Bitter varieties were generally converted into dry products, such as *caya* - freeze-dried oca, squeezed and deprived of its water content to allow longer preservation (Interviews with farmers in Cachilaya 21-03-2013). Although oca was grown in all three communities, it was not as common as potato. For example, while a certain diversity of this tuber was conserved in both Cachilaya and Coromata (8 varieties in the first community, and 7 in the second, according to data gathered over the last 6 years), it was produced by most farmers in Cachilaya (18 out of the 24 I worked with), but only by a few families in Coromata (3 out of 24) - Survey data crossed with PROINPA reports "Informes SINARGEAA" - *Sistema Nacional de Recursos Genéticos para la Agricultura y la Alimentación*, 2008.

Other native products could only be found in certain locations. **Cañahua**, for instance, was grown exclusively in Coromata. The climate here was particularly dry and frosts frequent. According to farmers from this community, people relied on it for its resistance to such extreme conditions and high nutritional value (Fieldnotes 28-03-2013). **Tarwi** was only cultivated in Okola, on the lakeshore. **Maize** was produced in Okola and Cachilaya - both of them on the lake - because of the mild climate. The tubers **isaño** and **papalisa** were there in all three communities, although relegated to smaller portions of land with comparison to other tubers (Fieldnotes 04-2013).

As far as non-native crops are concerned, **barley**, **oats** and **alfalfa** were grown widely, and mainly used as forage. **Broad bean** was produced in the three villages and - as farmers acknowledged - it was a staple in farmers' diet, especially in April and May when it was harvested (Survey and relevant follow up conversations with respondents; Fieldnotes 05-2013).

Intra-specific diversity of potato and its classification

Potato is one of the main staple crops in the world, the fourth after wheat, rice and maize (CIP & FEDECH 2006). It was cultivated for the first time in the Lake Titicaca region between Peru and Bolivia (Arbizu & Tapia 1992), where today more than 2000 native varieties are conserved

(Tapia & Fries 2007). Originally, indigenous farmers of the Andes domesticated nine different species of *papas* - now adapted to different climatic and environmental conditions - starting from three wild species. In Bolivia, according to the classification of Ugarte & Iriarte (2009), smallholder producers have maintained eight. I will focus on *papa* to explain how the diversity that Aymara farmers from the Altiplano Norte handle in their plots is structured and classified.

A preliminary clarification is necessary. There is no single agreed-upon taxonomic classification for the species and the varieties of indigenous crops, and different options exist. As I could observe in the field, scientists and farmers often do not use the same criteria. Scientists rely on technical differentiations that refer to specific botanic and agronomic characteristics of varieties. Farmers, instead, adopt parameters that lead to the formation of clusters, which differ from region to region, if not from area to area within each region[63]. Their capacity to distinguish varieties depends on the knowledge they hold about their agronomic properties and their culinary use - i.e. on the familiarity they have gained through a constant contact with them (in production and consumption). This aspect is of crucial importance for understanding the analysis of the contents of agrobiodiversity-related knowledge and the relevant transmission channels (5.3.2 and 5.4.2).

[63] During a "*día de campo*" ("field day") organised by PROINPA in March 2013, farmers from Coromata and Cachilaya met in Cachilaya in a festive set-up (picture 5.8). The purpose of this event was to give the people who had taken part in the activities and workshops promoted by PROINPA the opportunity to exchange the knowledge they had acquired, their expertise, as well as seed varieties - if they so desired - with each other and with the farmers who had not got involved in PROINPA's work. The *día de campo* was also meant to be an occasion for the entire community (including authorities) and for external stakeholders (chefs, scientists, and other special guests) to see what the farmers, under the guidance of PROINPA, were able to offer in terms of resources and knowledge. Some people from Cachilaya were impressed with the diversity of cañahua that a farmer from Coromata showcased. They asked repeatedly for the names of the different colourful varieties. In their community, in fact, they had very little cañahua. Furthermore, several farmers explained to me that some *papa* varieties were called with different names in the two communities, although they used the same names for most of them. To further reinforce the point that the indigenous nomenclature is largely based on varieties' use and that names for different varieties can change within short geographical distances, I will add that, during my fieldwork in Bolivia, it was impossible for me to find a piece of work that reported in detail the composition of the diversity conserved on-farm in the whole Altiplano Norte area. A study of this kind is extremely difficult to produce. It would require a joint effort from both indigenous smallholders and scientists. The fact that the nomenclature used for agricultural varieties is not homogeneous makes the composition of a coherent picture a real challenge. The studies that scientists have produced so far are either one of two types: 1) a survey that is geographically broad, but general from an agronomic perspective (i.e. it stops at the "family" level for each crop without delving into the distinction between varieties); 2) a very specific agronomic monitoring (i.e. reaching the variety level, by relying on the indigenous nomenclature) that is, however, geographically very narrow (i.e. the focus is kept on one single community - Mamani Alvarez 2011; Alarcon Vicente 2011; Quispe Sequeiros 2010; Torresin 2010).

Table 5.2: Potato species conserved in Bolivia

Sweet *papas*
S. tuberosum ssp. *andigena*
S. goniocalyx
S. stenotomum
S. phureja
S. x ajanhuiri
S. x chaucha
Bitter *papas*
S. x juzepczukii
S. x curtilobum

Iriarte, Condori, Parapo, & Acuña 2009.

Potato species can be divided into two broad groups - sweet and bitter *papas*. This classification responds to the tubers' organoleptic properties[64], but it is also connected with the use that is made of them. In my three fieldwork sites, indigenous farmers generally cooked - boiled, fried or stewed - sweet *papas*, while they transformed bitter *papas* into *chuño* and *tunta*, freeze-dried products. Bitter *papas* are particularly resistant to frost and, therefore, they are important for distributing risk of frost-induced crop failure.
According to the catalogue by Iriarte, Condori, Parapo, & Acuña (2009), out of the eight species listed in table 5.2 by their scientific name, six (those marked in green) are grown in the Altiplano Norte.

A number of researchers focusing on the Andes report that farmers generally use a combination of three different methods for distinguishing among potato varieties: common taxonomy, morphologic descriptors and indigenous nomenclature in the local language (de Haan 2009). Agro-morphologic characters are what connects farmers with genetic diversity when it is conserved *in situ* (Jarvis et al. 2000). Indeed, farmers observe phenotypic features, mostly agro-morphologic traits, to identify varieties (Mamani Alvarez 2011; Quispe Sequeiros 2010; de Haan 2009; 5.4.2). Important indicators, in particular, are fruits (tubers in the case of *papa*) - i.e. colour, size and shape - and sometimes the characteristics of the plant - i.e. stem, leaves, flowers, plant architecture (García & Cadima 2003).

[64] With reference to food these are those aspects that can be experienced by using senses like taste, sight, smell and touch.

In his study on the biodiversity of *papas* in the Aymara community Cariquina Grande, Lake Titicaca region, Mocomoco municipality, Mamani Alvarez identifies a set of 12 criteria that farmers use for the classification of potato varieties:

1. Taste of the tubers
2. Growing habit of the plant (erect, semi-erect or prostrate)
3. Colour of the stem of the plant
4. Colour of the flower
5. Main colour of the skin of the tuber
6. Secondary colour of the skin of the tuber
7. Distribution of the secondary colour on the skin of the tuber
8. Main colour of the pulp of the tuber
9. Secondary colour of the pulp of the tuber
10. Distribution of the secondary colour in the pulp of the tuber
11. Shape of the tuber
12. Depth of the eyes

According to Mamani Alvarez, the most used are the shape and the taste of the tubers, and the growing habit of the plant. They were indeed in my fieldwork sites (5.4.2). However, although agro-morphologic and organoleptic characteristics are important parameters, indigenous farmers' classification of *papa* is strongly based on the use made of each variety, with reference to consumption and transformation. Specific agronomic properties (i.e. resistance to hail or frost) also determine the distinction between different groups of *papa*. The names given to varieties in the Aymara language reflect uses, properties and exterior characteristics.

According to my own elaboration, based on published sources (Iriarte et al. 2009; Ajata Rivera 2011; Alarcon Vicente 2011; Mamani Alvarez 2011, and PROINPA's 2006-2007 annual report for SINARGEAA) and on the data collected in Cachilaya and Coromata, farmers classify potato varieties as follows.

Table 5.3: Families of potato varieties according to farmers' classification

Imillas	Tubers are rather big, have a round shape, and can have different colours. They have deep eyes and a light-coloured flesh. They are generally cooked - they can be eaten cold after being boiled without cutting (*munta*), or in soups. Their skin is removed before eating. They perform well in different types of soil - clayey, sandy and rocky.
Qhatis	Tubers can be of different shapes and colours, but most of them have an elongated shape with superficial eyes. They are generally boiled without peeling and they are eaten cold in the *merienda*, the shared meal that is consumed during the mid-day break from work in agricultural plots.
Palas	Tubers are flat and eyes are superficial. They are generally used for *chuño* or *tunta* and they are rarely eaten fresh. They are easy to peel.
Pulus	Tubers are of oval shape. They are generally used for *chuño* or boiled and consumed fresh.
Mixas	The internal flesh of the tubers can be of different colours, as they have a "stained heart". They have a floury texture.
Lukis	Tubers have small and deep eyes. They generally have oval and elongated shapes. They can have different colours, and they have a watery texture. They are resistant to frost. Their plant is short and branches bend to the ground. Their taste is bitter and they are generally used for *chuño* or *tunta*.
Axawiris	Tubers are of elongated shapes. They are semi-bitter and resistant to frost.

Own elaboration based on Iriarte et al. 2009; Ajata Rivera 2011; Alarcon Vicente 2011; Mamani Alvarez 2011; PROINPA's 2006-2007 annual report for SINARGEAA.
Note: *Imilla* means little girl in Aymara. Nowadays, however, *imilla* is often used with a disparaging connotation in Bolivia.

In order to provide the reader with an overview of the specific diversity conserved on farm in the Altiplano Norte, a table is included in Annex 1. It shows, for each of the species cultivated in Coromata, the number of varieties conserved by each family of a group of 28 from this community.

5.3.2 Indigenous knowledge as a fundamental part of agrobiodiversity

Alongside agricultural varieties a rich body of knowledge must be included in the notion of agrobiodiversity. According to Article 8(j) of the Convention on Biological Diversity, each contracting party must "respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application".

This is a clear mandate for on-farm conservation (Wood & Lenne 1997), which entails a recognition of the fundamental role of farmers and of the conservation of indigenous knowledge. Knowledge is instrumental for the conservation of agrobiodiversity, and exploring how roles and responsibilities, along with relevant information and practices, are distributed within farmers' families and communities is crucial to understand how broader transformations impact upon each aspect of agrobiodiversity conservation (Jarvis et al. 2000).

Knowledge distribution according to gender?

To understand what is included in the knowledge conserved in the Altiplano Norte, a gender-based perspective can be adopted. In Coromata, Cachilaya and Okola women held some pieces of knowledge, while men handled others (Survey data; Fieldnotes 01/06-2013). Women could name agricultural varieties better, and speak about cooking and nutritional properties of agricultural products and wild species more easily than men. Men, on the contrary, were more concerned with productivity issues and production techniques, and more curious about "modern" externally introduced varieties. My explanation of this is that, while women have traditionally been more involved than men in seed selection and in the preparation of meals, men have historically been Aymara families' eyes on the outside world, although nowadays both men and women are equally involved in rural-urban migration and connected with cities and markets.

Knowledge was also held irrespective of gender. Most farmers were equally aware of the impact of climatic agents and soil conditions on crops' yields, and familiar with the agronomic properties of the varieties they owned. Furthermore, men and women in communities and within families perform different but complementary tasks in agrobiodiversity conservation and in agriculture overall. For example, during sowing sessions, men usually ploughed the plots, while women placed seeds in the furrows, according to the traditional belief that it must be the women, representing fertility, to do this (Fieldnotes from an oca sowing session 19-10-2012).

Knowledge distribution according to age?

Age is an important factor in knowledge distribution. As 5.4.2 explains, agrobiodiversity-related knowledge is acquired through different channels, the most important of which is inter-generational. It is self-evident that elderly people, as compared to youth, hold a broad body of knowledge that comes from experience. In particular, the elderly maintain knowledge

linked with popular sayings and stories, which younger generations today do not trust and are not eager to learn, as I will now demonstrate.

In Coromata elderly people used environmental indicators to make predictions about harvest or precipitation. They said, for instance, that if the eggs of *leke leke* (a local bird) had big dark spots during the sowing season, production of *papa* would be good. If spots, instead, were small, production would be bad. Another of these indicators was linked with the behaviour of the insect *Wilapankataya*. If it appeared in swarms during the sowing period of cañahua, precipitations would be scarce (Alarcon Vicente 2011). Young people did not rely on such indicators, and preferred "scientific" methods based on written sources and on the expertise of urban-educated agronomists (6.4.5). They considered local indicators untrustworthy, especially in an epoch of climate change. For example, they believed that precipitations were so erratic that environmental signs to predict them were not effective anymore (Interviews with teenagers 02-2013).

While the elderly conserve an important part of agrobiodiversity-related knowledge, younger generations arguably hold another equally important one, which derives from their first-hand experience in a *desakota* space in continuous transformation. Their knowledge and skill - shaped by an urban mentality - are extremely important for the future of agrobiodiversity conservation, which depends on the capacity of relevant practices to adapt to the current "new rurality" context.

A "shared custodianship" of agrobiodiversity at the family and at the community level

As Gruberg[65] et al. argue with reference to Cachilaya, at the family level men and women often perform a "shared custodianship" of agrobiodiversity, because they both "carry out different roles and responsibilities necessary for on-farm conservation" (Gruberg et al. 2013, p.15). A shared custodianship, based on a precise definition of roles, also exists at the community level, where each task goes hand in hand with a specific body of knowledge.

One example from Coromata: every year the community assembly nominated a *yapu campu* - a custodian of the plots - among the village's inhabitants. Don Carlos from Coromata was the

[65] Helga Gruberg is a Bolivian scientist who between 2012 and 2013 worked for both Bioversity International and PROINPA. During my fieldwork our activity occasionally overlapped in Cachilaya. Besides supporting each other in challenging situations during our work in this community, we were toghether in several moments that we shared with the farmers while pursuing our different - although at times complementary - research objectives (her focus was on the role of custodian farmers). The numerous conversations and discussions we had in the field are reflected in my engagement (particularly in this chapter and in 7.2.4) with the arguments presented in the book she wrote in collaboration with other Bioversity and PROINPA scientists. The book, published in the autumn of 2013, is based on the data she collected in Cachilaya.

yapu campu the year before I met him. He explained to me that a *yapu campu* was responsible, during a period of 12 months, for protecting the crops in the collectively owned land[66] against adverse weather events and other threats. When a hailstorm approached the *yapu campu* had to bang firecrackers to disperse the clouds. He also had to keep birds and other animals away. Men normally performed this role - assigned on a rotational basis - for being a hard and potentially dangerous job. The *yapu campu* had to sleep in the plots and supervise the crops day and night. He had to have familiarity with the territory, be aware of the location of different crops, of the signs that indicated a possible change of weather, and the remedies that prevented plots from being damaged. According to Don Carlos, the family of the *yapu campu* could gain a bad reputation if the harvest was not satisfactory, because this meant he had not performed his role well (15-11-2016). In the community, it happened to me several times to hear farmers complain about the poor performance, in previous years, of specific families. In one particular occurrence, *residentes* - also eligible - were criticised for their lack of commitment and knowledge (Fieldnotes 28-11-2012, participant observation a few days before the nomination of the community's authorities).

Although every year one man was the *yapu campu*, this role was not assigned to a farmer, but to a family, whose members contributed, all of them, to the success of each relevant activity.

"*Cuando trabajaba en La Paz mi esposa se encargó de ir a las reuniones*" ("When I was working in La Paz, my wife would attend the meetings"), declared proudly a Coromata farmer, telling me about his experience as community authority (15-11-2012). The burden of collectively assigned responsibilities was distributed at the family level and also at the village level thanks to a rotational mechanism. Relevant knowledge about territory, crops and climate was therefore held collectively.

5.4 How is agrobiodiversity conserved?

Agricultural varieties are conserved in the Altiplano Norte thanks to the activity of farmers who, year after year, sow them in their fields. As it emerged already in the previous section, two distinct but interconnected and mutually influencing dimensions must be taken into account in the analysis of conservation practices: the family and the community. Below the family and the community spheres are considered separately for the sake of clarity. However, in practice, they both belong to a reality in which the private and the collective coexist. The

[66] More about collective land in 5.4.

same people and spaces are involved in both, and both change and adapt in response to the same challenges.

Agrobiodiversity conservation in an Aymara community: the collective dimension

Agricultural activities in the region surrounding Lake Titicaca were carried out based on the Aymara traditional management of land and crops. In Cachilaya, Coromata and Okola different types of land existed according to their location within the community's territory, the type of ownership exercised on the land, and the cultivated crops - *aynocas*, *sayañas*, and *jochi iranas*. I obtained the information presented below through interviews, participant observation and the use of participatory mapping in focus groups (20-02-2013; 18-03-2013; picture 5.1).

1) The *aynoca* is a communal space, managed by all the families of the community. In Cachilaya, for example, *aynocas* could be found both in the *cerro* (the hilly area at one extreme of the village) and in the *pampa* (the flat area at the other extreme). This land was sown with *papa*, quinoa, barley and oats - in decreasing order of quantity of land occupied. Land was divided into small agricultural plots (not bigger than 3500m2 each), cultivated by different families. Plots were assigned according to a rotational system. The crops to be grown in each specific area of the *aynoca* and the fallow periods were also established through a collective decision-making process that occured at the community level, according to a rotational pattern and to specific considerations based on contingent climatic or biotic conditions. The same happened in Coromata, where the plots of the *aynoca* were in the flat *pampa* all around farmers' houses.
2) The *sayañas* are the privately owned plots, cultivated individually by each family. Here farmers grew crops for their own subsistence, according to their choices and needs.
3) Finally, *jochi iranas* are the plots situated on the shore of Lake Titicaca. They are privately owned by farmers' families. They could be found in Cachilaya and Okola next to the lake. Here the soil was fertile and moist but the excess of water in the fields often damaged crops during the maturation stage. In February 2013, for example, the farmers of Cachilaya had to harvest their plots on the lakeshore much earlier than normal. Although tubers were still small and young, they had to extract them to prevent them from becoming rotten and un-consumable, as plants were submerged by water. Farmers reported that the likelihood of losing *jochi*

iranas' crops has increased recently because of over-abundant out-of-season precipitations (Fieldnotes 18-02-2013; picture 5.2).

Picture 5.1: Map of Cachilaya prepared by farmers through participatory mapping

Cachilaya 20-02-2013.

Picture 5.2: A farmer "rescues" potatoes from a flooded plot

Cachilaya 18-02-2013.

In the potato plots of the *aynoca* in Cachilaya and Coromata farmers sowed just one or two varieties on most land. These varieties were *papa Huaycha*, which unquestionably occupied the largest quantity of land in the whole Altiplano region, and *Ajahuiri*, *Chiyara Imilla* or *Wila Pala*, which were given less space, but anyway a considerable number of furrows. When I asked farmers why they particularly valued *papa Huaycha*, I was told "because it gives high yields". In addition, the size of its tubers was big; their shape round, their texture floury and their taste sweet. Tubers' eyes were not too deep, which made peeling and cooking easy.

Only a small portion of the plots was occupied by other varieties, which were sown all together in a few furrows for risk distribution and conservation purposes. Diversity was situated mostly in these tiny land portions, where, although in small quantities, it was possible to find most varieties. Quinoa and cañahua varieties were also maintained for reasons of risk distribution. Farmers showed a preference for varieties like *Janqu Jhupa* - white quinoa, *Wila Jhupa* - red quinoa, *Choquepito*, *Real*, and the improved varieties *Jachagrano* and *Blanquita* because of their high yields and resistance to pests. These occupied most land, although several other quinoa varieties were sown in fewer furrows.

Agrobiodiversity conservation in response to each family's needs: the importance of seed selection

As Alarcon Vicente (2011) suggests, agrobiodiversity is there in all three forms of traditional land management. I could confirm this by observing that the arrangement of varieties in privately owned plots was the same as in collective ones. Most diversity was concentrated in a few furrows, while a few varieties occupied most land (Fieldnotes and survey data 03/06-2013).

The land owned privately by farmers' families, however, is notably where most agrobiodiversity is hosted (Quispe Sequeiros 2010; Gruberg et al. 2013; Alarcon Vicente 2011; Mamani Alvarez 2011; Torresin 2010). Here farmers cultivated more species and more varieties. In the tiny plot in front of their house, for example, Don Miguel and Doña Roxana from Okola sowed 20 varieties of *papa*, 6 of oca, 6 of maize, 5 of quinoa, 5 of papalisa, 3 of tarwi, and 3 of isaño. Besides native crops, they also grew carrots and onions (Interviews 04-2013).

Gruberg et al. (2013) argue that the relationship between crops and families' needs is stronger in *sayañas*. Indeed these plots were close to farmers' houses and women were constantly

present there. Land was used for the production of each household's food, so crops reflected directly each family's needs and preferences.

The close relationship of families with their crops was particularly evident to me while observing the practice of seed selection, performed after the harvest between March and May. Women from each household sorted tubers according to the use assigned to them. They sat together and separated the seeds from the tubers that would be eaten, according to the size and the number of eyes in the tubers. Women showed to know well which varieties could be used for cooking (according to taste, ease of peeling, duration of the boiling process, texture, and family members' preferences), which ones would be better for preparing *chuño* and *tunta* (generally the bitter potatoes such as Lukis, the small potatoes which are difficult to peel, the broken ones, the potatoes attacked by maggots that must be cut), which ones could become seeds for the following sowing (the good ones, those with buds). Farmers explained to me that similar activities were carried out for the tubers oca, papalisa and isaño, while the selection of grain seeds was a less complex process. After harvesting and threshing, seeds were separated - a portion stored and then consumed or sold; another one kept and used as seeds in the next sowing.

5.4.1 The acquisition of seeds between traditional practices and new transmission channels

Traditionally seed selection after the harvest has been the main mechanism to obtain seeds in the Lake Titicaca agro-ecosystem. In rural communities farmers used seeds regularly to maintain them. Tuber seeds, for example, had to be sown every year, due to their preservation period being much shorter than grain and legume seeds (these could be stored for several years after the harvest). A few months' time, instead, was the maximum period of survival of potato, oca, isaño and papalisa seeds. In order for varieties to survive within an indigenous community, someone had to sow them year after year.
Conservation performed as part of a self-sufficient family's agricultural activities was not, though, the only way for conserving agrobiodiversity at the family level.

Before illustrating the different channels of transmission of agrobiodiversity in the Altiplano Norte, it is worthwhile explaining - based on the relevant literature - why indigenous farmers use them. According to Subedi et al., who studied on-farm conservation in Nepal, the acquisition of landraces and improved varieties has the following causes:

1) Shortage;

2) Replacement of poor quality seeds;
3) Interest in growing better cultivars;
4) Desire to test new cultivars (Subedi et al. 2003).

The same happened in the Lake Titicaca region, although in line with context-specific dynamics. If a farmer did not own any productive seeds any longer, he would say that his seeds got tired - "*la semilla está cansada*" (Interviews 09-2012; 02-2013, Cachilaya). His production, in other words, was lower, and plants and fruits smaller (smaller tubers or smaller sheaves in the case of grains). During my fieldwork I often heard from farmers "*produce pequeño, esta semilla ya no se puede usar*" ("these seeds are giving small products, we can't use them anymore"). Farmers did not usually keep any seeds from a variety whose production was no longer adequate. They replaced the seeds that had exhausted their reproductive capacity with new ones (Fieldnotes 26-09; 03-12-2012). In the case of potatoes - farmers informed me - deciding to abandon seed varieties entailed that tubers were either consumed straight away, after cooking, or - more often - transformed into dehydrated products, *chuño* and *tunta*. For preparing *chuño*, farmers would alternately expose tubers to frost and solar radiation, and squeeze them for eliminating excess water. For *tunta* they would put frozen tubers into the water, in rivers or pools, before drying them in the sun. Through these techniques they could rely on a continuous supply of food, fundamental for families' food security. Dehydrated products could be stored for several months, up to three or four years. It can be concluded that producing *chuño* and *tunta* was a common strategy when an additional amount of tubers became suddenly available for consumption, due to the choice to give up on seed conservation.

P1: Nos gustan las variedades Huaycha, Chiyara Imilla y la Sani porque producen más grande.

P2: Hacen papas como cabeza de niño.

[…]

P3: La semilla mejorada produce más grandecito, la nuestra está cansada. Pero no perdemos nuestra semilla, seguimos sembrando.

[…]

Q: ¿Y la semilla de quinua también se cansa?

P1: Sí.

Q: ¿Y qué hacen?

P1: No sembramos.

P2: Igual con papa. Las papas más grandes las usamos para comer, las más pequeñas para tunta o chuño.

P1: We like the varieties Huaycha, Chiyara Imilla and Sani because they produce bigger.

P2: Tubers are as big as a baby's head.

[…]

P3: Improved seeds give bigger products, while ours are tired. But we don't want to lose our seeds, we keep on sowing them.

[…]

Q: And do quinoa seeds get tired too?

P1: Yes.

Q: So what do you do?

P1: We don't sow them.

P2: The same we do with *papa*. We eat the bigger tubers and we use the smaller ones for making *tunta* or *chuño*.

(Cachilaya, Focus group 26-09-2012)

Farmers from the Titicaca region also acquired new seeds because they wanted to test new varieties and improve their production. On several occasions during my fieldwork, young men showed a special interest in modern high-yielding varieties. For example, when scientists brought seeds of improved varieties to Coromata, two younger men were the most curious in the group of ADAMA farmers about the properties of the new seeds, their origin and their yields (Fieldnotes 18-10-2012).

They also did so because they were eager to restore their little patrimony of genetic diversity by re-obtaining from other people the varieties they had abandoned earlier on. I observed this particularly during the agrobiodiversity fair of Coromata, where women from Cachilaya, attending the fair with their seeds, did *trueque* (barter) with local women. They acquired some *papa* seeds they used to have but had lost. They said they were attached to them because of their cooking and taste characteristics. Furthermore, two of them were real collectors of seed varieties and considered owning a wide diversity important (5.5.4).

According to the literature (Subedi et al. 2003), flow of genetic material can occur through the following channels:

1) Exchange and barter;
2) Purchase within and outside the community;
3) Borrowing of seeds or seedlings, or gift.

In the Altiplano Norte, these channels were embedded in a series of Aymara traditional practices. Furthermore, in addition to intra- and inter-community mechanisms of seed introduction, the market played an important role, in the form of both rural fairs and urban markets or shops. Finally, external urban-based actors - like scientists and researchers, as well as migrants, moving between rural areas and cities - were part of seed flows. I will now discuss these channels based on the evidence I gathered in rural communities.

For simplification purposes, in my analysis below I make a distinction between "traditional channels" - in this case including the practices responding to dynamics consolidated throughout the centuries; and "modern channels" - including the channels of more recent origin, which involve urban-based actors like scientists, NGOs and *residentes*. These two broad and artificial categories were not completely distinct in practice. Firstly, some channels were indeed based on traditional acquisition mechanisms, but emerged in new and unusual forms, moments and venues, following the establishment of "modern" practices, promoted by external actors (i.e. agrobiodiversity fairs, or community agro-tourism). As a consequence, seeds travelled according to traditional channels but because of choices and preferences determined by contingent environmental, social and economic occurrences and challenges. Secondly, initiatives launched in indigenous communities by scientists and NGOs were designed in such a way that indigenous values and traditions were respected and built upon. This aimed at avoiding that innovations like agrobiodiversity fairs or Community Seed Banks[67] "undermine(d) the existing local systems which link(ed) together people who trust(ed) one another's judgment and exchange(d) seed along with other forms of goods, aid and information" (Sthapit et al. 2006, p.19). In the Altiplano Norte - to avoid threatening the local agro-ecosystem and way of living - Community Seed Banks, for example, although created by NGOs, were based on the principles of reciprocity and resource sharing, and on collective property. Thirdly, market-based exchange *per se* cannot be considered as either traditional or modern.

[67] Further below in this section I explain these initiatives along with the different channels of seed and knowledge transmission.

Traditional channels

In the Altiplano Norte seeds were acquired by farmers through the following "traditional channels":

1. *Autoconsumo*[68]-based channels: Seeds came from farmers' own harvest. Based on this principle, new families were given seeds as a wedding present by relatives and friends. Seeds received by the bride and by the groom were put together when a couple formed a new household (Unstructured interview with PROINPA agronomist 06-09-2012). According to the farmers of Cachilaya and Coromata this practice was slowly disappearing. Young couples received gifts such as furniture or money for the payment of their study expenses (Fieldnotes 26-09-2012). However, inheriting seeds from parents was still a possibility for youth in Altiplano Norte rural villages.
2. *Intercambio a nivel intracomunal* (exchange of seeds within communities): Seeds were received from neighbours as a gift, a loan, or a compensation for work. Specific acquisition dynamics are analysed below.
3. *Intercambio a nivel intercomunal* (exchange of seeds with people from other communities): Seeds were introduced as a result of a) one of the traditional practices analysed below; b) sale; or c) *trueque* (barter) involving friends or relatives in other communities (Fieldnotes 06-10-2012). Barter was rarely used. In Cachilaya, for example, some farmers exchanged seeds in *ferias* or with people from different villages that they knew. Doña Patricia, for instance, told me she had obtained part of her seed diversity by doing *trueque* with a *cholita* from another village (Interview 27-09-2012). In Coromata, on the contrary, farmers reported that this practice had fallen into disuse (Focus group 03-12-2012).

Some traditional practices occurring frequently in the Altiplano Norte could generate a transfer of seeds amongst farmers of the same or of different communities.

- *Ayni* is the indigenous practice of exchanging favours and goods. It translates into a social obligation applied to different spheres of community life. In the agricultural sector it was common for farmers to help each other in the sowing and harvesting work.

  "*[During the harvest session] two teenage girls are there to help the family of Don Alfonso [their neighbour]. […] They walk away with their* aguayos *full of* papa. *They*

[68] Self-consumption.

took it as agradecimiento *(expression of gratitude) and compensation for their work*" (Okola, 15-04-2013).

When farmers worked in each other's fields, they often got compensated with a portion of the harvest. Money was not generally used for paying work in the plots of other community members, although monetary compensation was also requested and accepted - more frequently than in the past, according to a local agronomist (Interview 06-09-2012). The acquisition of agricultural products from the plots of a relative, a friend or a neighbour allowed farmers to expand the range of seed varieties to sow in their own plot.

- Plots were sown "*al partir*", when farmers put their resources together. Different situations in which this practice was used were reported to me during my fieldwork. If, for example, a farmer owned seeds but did not have any land and another one owned land but did not have any good seeds, the two would join efforts: one would put the land, the other one the seeds. The land would be divided into two equal portions and each farmer would take care of one. Each farmer would then take the harvest of his part. Similarly "*maekipa*" would entail a division but according to different criteria. In the case of a non-homogeneous field (a field - for instance - on a slope, or with a more fertile part or a rocky area), one farmer would take care of a furrow and the other one of the next, and so on. The harvest would be divided accordingly. These two practices would lead to a transmission of seeds among farmers' families, with a multiplication of owned varieties.

As Jarvis et al. (2011) argue, traditional informal seed sources are the most common in rural farming communities of developing countries. The Altiplano Norte was no exception. Here hiring *jornaleros* (daily workers) was rather common amongst farmers' families (Fieldnotes 03-2013). However, extra labour was sought frequently through the practices illustrated above. As a consequence, genetic material was normally obtained following logics of reciprocity, sharing and complementarity, typical of Aymara communities. The exchange of genetic material amongst farmers demonstrates that in the Altiplano Norte, like in other rural societies of the South, "social relations play an important role in seed acquisition" (Jarvis et al. 2011, p.149).

In the Altiplano Norte "new rurality" scenario, mutual influences exist between the countryside and the city. Distinctive values of the Aymara culture - at the basis of agricultural practices in indigenous communities - are also central to the *cholo-mestizo* lifestyle in urban areas. At the same time, the challenges generated by the market and the spreading of an

income-generation and consumption-oriented mentality reshape indigenous practices in rural villages. In order to adapt to new needs and stimuli, traditional practices undergo important changes in rural areas. The same happens, though, to indigenous practices, deeply rooted in the city as part of the *cholo-mestizo* culture. *Ayni*, for example, has survived in cities. As I learnt in La Paz, it was applied to contexts like construction works or the preparation of a celebration. "If the daughter of a man gets married, a friend of his will bring a few boxes of beer to the celebration, if this is necessary", a woman of Aymara origin who lives in El Alto explained to me. "When his daughter gets married, the other man will do the same for him. It is a sort of social obligation" (Fieldnotes 23-03-2013). Conversely, in the rural Altiplano, although the core values of *ayni* remained intact, this practice increasingly involved monetary payments. Far from having turned into paid labour, however, *ayni* still relied on a reciprocity pattern, and entailed the social obligation for whoever received the (paid) favour to return it as soon as circumstances allowed.

Seed acquisition through the market

The market can be situated between the "traditional" and the "modern" seed acquisition methods. Most subsistence farmers of rural communities relied on the mechanisms analysed above. According to the results of the Andescrop survey in Cachilaya and Coromata all farmers (100% of those surveyed in both communities) used "*semilla propia*" (their own seeds) for most of their production (on average 89% in Coromata and 91% in Cachilaya). The other sources of seeds that farmers mentioned were acquisition from neighbours and purchase for specific crops within each household.

Smallholders bought seeds from local markets (*ferias* taking place in small rural cities - such as Batallas, close to Cachilaya, and Chachacomani or Kerani, close to Coromata), or from bigger urban markets (such as the *feria de El Alto*).

Buying genetic material from markets is not in itself something new and necessarily "modern". As Jarvis et al. (2011) state, farmers around the world, besides relying on their own seed supply, do demand off-farm seeds, generally as the result of an emergency - a personal one, such as a health problem or individual production failure, or one affecting the whole community, like a flood or drought. What I consider new is not the act itself of buying seeds, but the logic emerging behind it.

Jarvis et al. identify the following factors as the main triggers that lead farmers to buying seeds in the market: "low yields, consumption or sale of seed stocks, poor seed quality, the desire to access new varieties, and changes in national policy that affect subsidies and grain imports"

(Jarvis et al. 2011, p. 148). In communities such as Coromata and Cachilaya, where agriculture was mostly for subsistence, buying seeds from markets was not too common overall (only 16.6% of farmers had the habit of buying seeds from the market in Cachilaya; 29.1% in Coromata - Survey data). Some farmers did it to reconstitute their agrobiodiversity patrimony after variety loss, or to enhance it with the acquisition of new seeds unavailable in the community. However, most people who did not rely on "traditional" intra- (or inter-) community seed acquisition methods and used the market, approached this source with the clear purpose of obtaining new "modern" technologically improved genetic material available in urban shops or *ferias*. The farmers I met who expressed this preference were generally men, and often *residentes* or people whose past or present experiences had increased their trust in modern science and technology and their physical and ideal proximity with the city (Fieldnotes 13-10-2012; 6.4.3). "*Compro semilla en la feria de Palcoco, o en la de Viacha, o en El Alto*" ("I buy seeds from the Palcoco fair, the Viacha fair, or from El Alto") - told me Francisco, a farmer from Cachilaya who used to live in La Paz before meeting his wife and getting married - "*Ahí compro semilla certificada porque da buena producción*" ("I buy certified seeds there, because they give good production" - Focus group 20-02-2013). In other words, according to my analysis, the "desire to access new varieties" - identified by Jarvis et al. - and to replace poor quality seeds to improve production clearly prevailed in the Altiplano Norte. Households relied on an increased availability of money deriving from income-generating activities. In addition, thanks to improved transportation and communication facilities, and temporary and permanent rural-urban migration farmers travelled to urban fairs frequently and easily.

New channels

New "modern" channels of seed acquisition have been in place since researchers and NGOs started operating in the Aymara villages of the Altiplano Norte, creating new platforms for seed gathering and distribution.

In Cachilaya and Coromata, for example, a Community Seed Bank and Crop Diversity Gardens were established with the support of PROINPA in the framework of a series of projects sponsored by IFAD[69]. Community Seed Banks in the Lake Titicaca region initially involved a group of "custodian farmers", as I learnt by interacting with local agronomists and consulting

[69] The projects IFAD NUS I ("Enhancing the Contribution of Neglected and Underutilized Species to Food Security and to Incomes of the Rural Poor" - 2001-2004), II ("Empowering the rural poor by strengthening their identity, income opportunities and nutritional security through the improved use and marketing of neglected and underutilized species" - 2007-2010) and III "Reinforcing the resilience of poor rural communities in the face of food insecurity, poverty and climate change through on-farm conservation of local agrobiodiversity" - 2011-2014).

PROINPA's project reports (i.e. the Annual Report for IFAD NUS III 2012). These are called "nodal farmers" by Subedi et al. 2003, and "seed custodians" by Jarvis et al. 2011. They are also defined as "pro-diversity" individuals, due to their "intrinsic interest in the preservation of […] traditional crops and varieties" (Gruberg et al. 2013, p.4) and a willingness to share seeds with other farmers within and outside their community. They are considered as sources of seed diversity (Subedi et al. 2003). In Coromata and Cachilaya, scientists - with the participation of the members of APROCA and ADAMA - created a group of "custodian farmers", responsible for pulling the agrobiodiversity patrimony maintained at the community level back together. According to my observations, these farmers could not be identified through specific gender or age characteristics, and were not necessarily those who conserved most varieties or knowledge in the community, as in Subedi et al. They were, however, charismatic and committed individuals, respected in the community, who would happily get involved in conservation-related activities proposed by external actors, try new seeds and techniques, and encourage other community members to do the same. The farmers chosen in Coromata and Cachilaya as "custodians" were the most eager to get involved in NGOs' initiatives and to put their time and resources at the community's disposal (Interviews with custodian farmers 09-2012; Focus group 26-09-2012; 7.2.1; 7.2.4). Under the guidance of scientists, "custodian farmers" had put their own seed varieties together and retrieved additional ones from other community members, with the purpose to gather all seed varieties available in the community and form a shared seed bank. With the assistance of scientists, farmers of APROCA and ADAMA sowed these seeds in collective plots (Crop Diversity Gardens) for multiplication purposes.

Thanks to this initiative, agricultural varieties had been retrieved and redistributed within the two communities and, through scientists, between them. Their support had been fundamental for the establishment of this seed acquisition channel (Unstructured interview with PROINPA agronomist 20-09-2012), which was based, however, on the indigenous values of collective property and sharing.

Starting from 2006, scientists also begun to organise agrobiodiversity fairs (*ferias de la agrobiodiversidad*) in indigenous communities of the Titicaca region, in the framework of the same projects. These events were held once a year in several communities in the post-harvest period. They were an opportunity for farmers to showcase the agricultural varieties that they owned. During my fieldwork I attended three agrobiodiversity fairs. In each community, on the day of the *feria*, a contest took place in the categories "agricultural diversity", "traditional foods", and "handicraft". The competition was won by the farmers who showcased most

agricultural varieties; cooked the largest number of traditional dishes; or prepared most ornaments, tools, or other objects by using local natural products. All participants were given little gifts (basins, matches, soap) and those with the highest scores won bigger prizes (gas stoves, picks, shovels, hand-carts, provided by NGOs and scientists). In all three cases women participated in larger numbers than men, and qualified first in the categories "agricultural diversity" and "traditional foods" (Fieldnotes from the agrobiodiversity fairs of Rosapata, Coromata and Cachilaya 08-2012; 09-2013; Agrobiodiversity fairs rankings 2009-2013).
Traditional authorities would be invited, as well as representatives from international organisations and NGOs, chefs from La Paz and the press. Farmers from other villages (other communities where similar conservation projects were on-going) attended them too and showcased their agricultural varieties, foods and products. Similar experiments carried out in other countries show that through agrobiodiversity fairs "farmers from different communities are brought together to exhibit a range of landraces: this allows farmers to locate rare and unique diversity and provides an opportunity to exchange seeds and associated knowledge" (Jarvis et al. 2011, p.148). In the Altiplano Norte too I could see how agrobiodiversity fairs were a platform for the acquisition of new seeds and for the exchange of information and knowledge among farmers of the community where the event was held, and with participants from other villages.

Scientists were at the centre of other seed acquisition channels, like the direct introduction of genetic material. In Coromata and Cachilaya, varieties, often coming from other communities of the Altiplano Norte or regions of Bolivia, were handed to farmers (Fieldnotes 18-10-2012). The same happened with seeds resulting from participatory selection processes or programmes of genetic improvement and with new varieties improved, cleaned and certified in the laboratories of PROINPA and INIAF (i.e. in the *Centro Experimental Quipaquipani*, or in the *Estación Experimental Toralapa*) for increasing their resistance to pests and diseases, adaptability to climatic conditions, and productivity (Gabriel et al. 2011).
During my fieldwork, scentists gave seeds to farmers of Coromata and Cachilaya several times (09/10-2012). Farmers accepted them with gratitude and welcomed them as gifts. However, according to PROINPA staff, not all new varieties immediately performed well in farmers' plots (14-11-2012). There were, however, some important examples of complete integration (i.e., as mentioned previously, *papa Huaycha* and quinoa *Jachagrano*).

I would like to conclude this section by focusing on the role of migrants. As illustrated in chapter 4, migrants in La Paz/El Alto participated regularly in the sowing and harvesting of

crops in their village. Young migrants helped their families during these important moments and personally took care of their furrows. Also *residentes* paid regular visits to their communities to sow and harvest in their plots.

Permanent migrants owing land and relying on a certain availability of money tended to buy seeds from the market rather than using the traditional channels of genetic material acquisition analysed above. "*Compro semilla certificada en la feria (de El Alto) […] porque quiero que produzca bien*" ("I buy certified seeds from El Alto market […] because I want my production to be good") Doña Rosmery, *residente* from Okola, told me proudly (21-03-2013). Although *residentes* participated in community life at best of their possibilities, their personal connections with community members and access to "traditional" channels of seed acquisition were weakened by their prolonged periods of absence. Furthermore, migrants prioritised high yields and varieties that required little care, unable to spend too much time in the fields (6.3.3).

The appeal of urban products and the trust that many farmers put in technology, turned migrants into important vehicles of introduction of new genetic material in rural communities (7.2.1, 7.2.2, 6.4.3 and 6.4.4). Both temporary and permanent migrants procured seeds in urban markets and shops and then passed them, upon request, to family members and friends in Altiplano villages. "*Esta (variedad) me la trajo mi hija de El Alto*" ("My daughter brought this variety for me from El Alto), acknowledged Doña Delfina while showing me one of her potato seed varieties (14-04-2013). "*Mis abuelos siembran la semilla certificada que yo les traigo*" ("My grandparents sow the certified seeds that I take to them"), a staff member from PROINPA with Aymara origins told me (03-12-2012). Her parents migrated to El Alto when she was little. As an agronomist, her relatives trusted her fully and she often gave her family the seeds that scientists considered the best performing ones. Every year she would travel from the city to her village of origin with her husband and daughter to participate in the sowing. Afterwards her parents would reserve a portion of the harvest for her.

5.4.2 Inter-generational and intra-generational knowledge transfer: the emergence of new transmission channels

Knowledge is transmitted in parallel with seeds. Genetic resources ("material flows") and agrobiodiversity-related knowledge ("non-material flows" - Subedi et al. 2003) travel together. According to the literature, along with seeds, "information like traits of the materials, management practices or how they would perform in different conditions as well as their uses associated with the genetic materials is also acquired" (Subedi et al. 2003, p.48). I will now

show how around Lake Titicaca knowledge concerning agrobiodiversity conservation was transmitted through both inter-generational and intra-generational channels. In the analysis below, while inter-generational knowledge transmission mostly refers to traditional mechanisms of genetic material transfer, intra-generational exchange occurs both in circumstances that can be ascribed to "tradition", and - increasingly - according to recently emerging dynamics.

I mentioned previously that in rural communities women were better than men at recognising crop varieties, because of their involvement in seed selection during the post-harvest phase. Most farmers could not recognise varieties during the sowing season (Fieldnotes 30-01-2013). Tuber seeds, with the exception of the few types occupying most space, were sown all together in the same furrows. When I took part in sowing sessions, I noticed that farmers did not pay attention to the exact spot where they placed specific seed varieties within a furrow. Later on, when colourful flowers appeared in the fields, it was difficult for them to take stock of all the tuber varieties they owned. As Alarcon Vicente (2011) and Mamani Alvarez (2011) suggest in their studies, and as I observed in Cachilaya and Coromata, only a few exceptional farmers could identify *papa* varieties by looking at the size of the plant or the colour and the shape of the flowers. Based on these parameters, they could identify the "family", which tubers belonged to (*Imilla*, *Luki*, *Qhati*, or only sweet potato or bitter potato), although they could not name specific varieties. In Cachilaya, Doña Lucía stood out for her remarkable ability to recognise potato varieties during the flowering season, just by looking at the plants (Fieldnotes 13-03-2013). It was easy, indeed, to be confused by varieties with similar plants and flowers. This job would become much easier for farmers after the harvest, when tubers were taken out and more elements were available as classification criteria - i.e. colour, size, shape of the tuber. In the post-harvest phase tubers were not yet wrinkled and dehydrated and still had their original colour and shape. As explained in 3.3.2, the post-harvest phase was the moment when farmers - women in particular - showed me all of their agrobiodiversity-related knowledge. Gender partly determined the distribution of roles and responsibilities within families and the community; knowledge, transmitted together with practices, followed the same pattern.

Children participated often in agricultural activities. It was evident that formal education absorbed a significant portion of young people's time in the communities. Furthermore, the prerogative of many teenagers in the framework of family-level task distribution was to take care of livestock by leading cows and sheep to pastures early in the morning and back to their

stables in the evening. However, youth were knowledgeable about agricultural cycles, practices and processes for crop production. By being present during the sowing and harvesting moments, and by helping their family with the activities of "*aporque*" (the process of covering up with soil the stems of tuber plants after germination) and "*deshierbe*" (weeding) they could learn from their parents and older relatives. Girls - by getting involved in seed selection, and learning how to cook, transform and use agricultural varieties for preparing meals - acquired relevant knowledge from their mothers and grandmothers. Information and skills connected with farming, cooking, and transforming products was - in fact -passed down from father to son and from mother to daughter. However, as many farmers reported, "*los jóvenes de hoy*" (today's youth) are not familiar with fundamental agricultural practices that - due to the incompatibility between agriculture and the plans that many of them have for their future - they leave in the hands of their parents (6.3.3). "*Los jóvenes de hoy ya no quieren aprender. Prefieren vivir en la ciudad. Vienen para cosechar y se llevan (el producto). No saben escoger semilla, o para hacer chuño o tunta. No saben cuándo se siembra. Ni saben manejar yunta*" ("Young people of today don't want to learn. They prefer to live in the city. They come for the harvest and they carry products away with them. They don't know how to choose seeds, and they can't choose tubers for *chuño* or *tunta*. They don't know when it's time to sow. They can't handle a plough properly") complained Don Miguel (Cachilaya 20-02-2013).

I observed that while practices like cooking generally happened in private spaces, others, like sowing, harvesting and seed selection, were carried out outdoors (in the fields or in front of farmers' houses). Besides the members of individual families, other farmers of the community participated, especially if plots were collectively managed or if the owner had benefitted from other farmers' support through *ayni*. Sharing such moments amongst people of different families and of different age groups would put in place an intra-generational dynamic of knowledge exchange. As Subedi et al. (2003) argue, "occasional network links", generated through such circumstances, "may be strong in the diffusion of innovations and messages, since occasional links will provide opportunity to find out more new information and material" (p.45).

External actors like NGOs and scientists also played an important role in the transmission of seeds and knowledge, establishing a new intra-generational channel.

- Firstly, in Cachilaya and Coromata, scientists assisted and supervised farmers during the sowing, harvesting and monitoring of externally introduced varieties, providing information about their characteristics and properties (Fieldnotes from a sowing

session of oca in Cachilaya and from sowing sessions of *papa*, and of quinua and cañahua in Coromata 19/24-10; 09-11-2012). When scientists introduced new seeds ("material" flow), relevant knowledge normally followed through the same channel ("non-material" flow).

- Secondly, awareness about the importance and the role of agrobiodiversity was raised as part of the activities linked with the establishment of Community Seed Banks and Diversity Gardens. Under the guidance of scientists, farmers were encouraged to notice how varieties responded differently to climatic events. For example, in Cachilaya, shortly before the 2013 harvest, most potato varieties of the Diversity Garden were burnt by an out-of-season frost. Just some *Lukis* survived. It was impossible not to notice that in the Diversity Garden all plants had turned black and withered except for those of one furrow that were still green and healthy. Agronomists invited farmers to observe the plot, emphasising how some varieties had shown better resistance as compared to others (Fieldnotes 21-03-2013; picture 5.3).

Picture 5.3: In the Diversity Garden burnt by heavy frost only *Luki* varieties survived

Cachilaya 21-03-2013.

- Thirdly, during my fieldwork NGOs arranged a few meetings between farmers and the representatives of private companies interested in purchasing native crop varieties (5.5.6; 7.2.3). By offering them selling opportunities and contacts, scientists would

bring the market closer to indigenous villages, allowing them to gain exposure to information about prices, potential selling venues and buyers.

- Finally, NGOs, tourists, researchers, chefs and international organisations would also be interested in the diversity conserved in indigenous farms, and willing to contribute to producers' activities by providing technology and funding. NGO-led initiatives further increased the involvement of urban-based actors, as the next chapters will show more clearly.

Picture 5.4: The cover of the recipe book prepared by PROINPA, including recipes of dishes using quinoa and cañahua; **Picture 5.5:** A cooking workshop run by scientists

La Paz 05-2013.


Cachilaya 29-05-2013.

Besides this informal and un-structured exchange of knowledge, formal training in the framework of internationally funded projects took place. In Cachilaya, Coromata and Okola NGOs offered workshops on the improvement of agricultural practices for better yields, particularly on issues like climate change and pests (PROINPA project reports 2006-2012). When farmers adopted new seeds, they were provided with specific pest control and seed management training sessions. Cooking classes were organised to teach farmers innovative and "modern" recipes using native crop varieties (Fieldnotes 19-09-2012)..

Lastly, also temporary and permanent migrants would dispense information while introducing seed varieties from the city. They were the bearers of a new mentality that - although maintaining important aspects of the indigenous culture - largely valued productivity, abundance, and monetary gains (7.2). Migration provided what I saw as yet another vehicle of informal knowledge transmission.

5.5 Why is agrobiodiversity conserved?

The reasons why farmers conserved crop varieties varied from community to community and from family to family according to specific circumstances. However, a series of recurring cultural, agronomic and economic factors encouraged farmers to preserve agricultural diversity in my fieldwork sites. These emerged as open explanations given in interviews by the farmers themselves; as the result of my observation of production and consumption habits; and through the analysis of choices in individual households.

5.5.1 The cultural component: a necessary layer on top of agronomic and economic factors

One of the accounts frequently given to me by NGOs, scientists, and even by some farmers was that agricultural varieties were maintained in the Altiplano Norte because of Aymara farmers' deep connection with their products and the important cultural value assigned to native crops and traditional food[70].

It is undeniable that indigenous people's identity is linked with the production and the consumption of local tubers and grains, and that Aymara subsistence farmers have a close relationship with their land and crops, which provide them with daily sustenance. Indeed, important moments of the community life are strongly linked with the presence of certain products in rituals and meals. For example, when I participated in *apthapis* - the Andean traditional meals, distinctive of rural lifestyle in Altiplano Norte - we consumed different varieties of *papa* and other tubers, of maize and broad bean, *chuño*, *tunta*, and *kispiña* (picture 5.5). *Apthapis* could either be rather frugal - when farmers working together consumed them in the fields during a break (*merienda*), or extremely rich - with bigger quantities of food including cheese, fish and eggs, at the occasion of larger and more festive gatherings. The principle of sharing - central in the Aymara culture - is at the basis of the *apthapi*. The food brought by each family, carried by women on their back in *aguayos*, was merged with the food brought by the others. When the bundles were opened on the ground - with women sitting in

[70] The few farmers who considered agrobiodiversity as a traditional practice - deeply embedded in the Aymara culture - and spoke about this openly were those who had a deeper and closer relationship with NGOs' staff compared with other farmers (i.e. the *de facto* leader of ASITURSO in Okola and the "custodian farmers" of Cachilaya and Coromata that I interviewed). Their explicit reflections seemed to be based on a strong awareness of the value of agrobiodiversity, which most farmers did not have, and to be the result of their close contact with urban-based actors.

a circle around the *aguayos*, and men standing behind them - everybody could take what they preferred.

Varieties of tubers and grains are at the basis of the Altiplano diet and farmers attach an important spiritual value to them. Numerous practices and rituals show the special connection that indigenous smallholders have with the *Pachamama* and its products. For instance, before beginning sowing and harvesting sessions, farmers of the Altiplano Norte would thank Mother Earth and invoke her favour and protection with a short ritual (Fieldnotes from a *papa* harvesting session in Cachilaya 02-04-2013; picture 5.6)..

Picture 5.6: Farmers thank the *Pachamama* before harvesting *papa*; **Picture 5.7:** An *apthapi*

Cachilaya 02-04-2013.

Cachilaya 19-09-2012.

Nevertheless, although true, the popular explanation that indigenous farmers conserved agrobiodiversity for cultural reasons was not satisfactory for me on its own. Aymara traditions and indigenous identity added further legitimacy, value and recognition to practices that were distinctive of the Andean lifestyle for purely utilitarian and strategic reasons, as the following sections will show.

5.5.2 Agrobiodiversity conservation as a risk distribution strategy

Pascual et al. (2011) suggest that the primary reason behind the maintenance of agrobiodiversity in smallholders' plots is that it is an effective risk distribution strategy. They argue that relying on a wide range of crop varieties is crucial to minimise the risk of crop failure and prevent a complete loss of the harvest due to pests, diseases, or adverse climate

("agrobiodiversity conservation, despite perhaps reducing mean yields, is a rational way to spread the risk of agricultural production shocks due to weather variability. This yield gap can be understood as the insurance risk premium that farmers are willing to pay to reduce their exposure to downside risks from climatic shocks" - p.195).

The evidence I gathered in the field confirmed this. In recent years NGOs have worked to drive smallholders' attention to the consequences of climate change and the role of agrobiodiversity conservation as an adaptation strategy. They have carried out several workshops on this issue to boost farmers' motivation to continue their conservation activities in the future[71]. Farmers, however, showed to me a high degree of awareness of most risks and mitigation strategies. In focus groups, for instance, they acknowledged that the agricultural calendar had changed and that the moments of sowing and harvesting had gradually shifted. They agreed that the agricultural cycle of *papa*, quinoa and cañahua had become shorter: sowing occured later because of the late beginning of the rainy season, and harvesting earlier because of floods from Lake Titicaca and heavy frosts (Focus groups Cachilaya 21-03; Coromata 18-03-2013). In a rural world where irrigation was not used and agriculture relied completely on nature's cycles, farmers complained for being faced with the pressing issue of protecting crops against the effects of longer dry seasons, sudden rainfalls or hailstorms, and exceptionally abundant precipitation. "*El año pasado perdimos todo a orillas del lago. El agua subió a las parcelas de papa y haba tres veces*" ("Last year we lost everything we had on the lake shore. The water flooded our potato and broad bean plots three times") reported Don Marcos (Cachilaya 20-02-2013).

Some farmers recurred to expedients like insuring plots against inclement weather. Since on average annual loss was high, in 2013 18 farmers in Coromata and 25 in Cachilaya decided to sign and pay for an insurance policy on the first day of the *campaña de afiliación* conducted by the insurance provider PROFIN (Data from PROFIN 2013). These were farmers with a reduced diversity portfolio. According to the data from PROFIN in bad agricultural years the majority of these people's production gets ruined or lost, due to climatic events or the attack of pests, which some of the most common varieties are prone to. Overall, farmers showed to particularly treasure *papa*, their staple food. They considered having a sufficient supply of this crop fundamental for their subsistence. Being unable to harvest enough *papa* for feeding all family members during the year was a risk that most farmers were not willing to run (Data from PROFIN; Unstructured interviews with Cachilaya farmers 25-01; 21-03-2013). Therefore,

[71] For example, PROINPA held a number of workshops in Cachilaya and Coromata as part of the project "Reinforcing the resilience of poor rural communities in the face of food insecurity, poverty and climate change through on-farm conservation of local agrobiodiversity" (2011-2014).

many owned a rich diversity portfolio, which included precocious varieties with a shorter maturation cycle. Overall, they knew that different varieties were suited to different climatic and soil conditions and had a different level of resistance to pests and diseases.

5.5.3 Consumption-related preferences: taste and suitability for cooking and transformation

Besides varieties' agronomic properties, preferences linked with consumption also influenced farmers' conservation choices. As Jarvis et al. (2000) argue, consumption characteristics increase varieties' value in connection with their use. Taste, for example, was one of the factors that determined the propensity of farmers to conserve specific varieties. Farmers stated that the taste of quinoa and cañahua did not change according to varieties (Interviews with Cachilaya farmers 27-09-2012). In the case of grains it was rather the agronomic properties that were taken into consideration by producers[72]. At the moment of grinding and consumption, grain varieties were mixed and it was not even possible to distinguish among them while eating (Interviews with Okola farmers and fieldnotes from participant observation in the post-harvest phase 04-2013). In the case of tubers, on the contrary, characteristics like taste, as well as texture, ease of peeling, cooking times, and suitability for transformation into dehydrated products, influenced farmers' preferences greatly. "*Esta variedad (de oca - Janqu Keni) está bien rica, es la más dulce*" ("This variety of oca is delicious, it's the sweetest type") Doña Juana said, while inviting me to taste the *oca soleada* she had brought for the *apthapi* (Cachilaya, 7-11-2012). "*Tenemos cinco variedades de papalisa. Nos gusta comer sopa de papalisa […]. Esta (variedad) tiene un gusto más picante*" ("We have five varieties of papalisa. We like eating papalisa soup […]. This (variety) has a sharper taste"), told me Doña Roxana, who cooked for me for one month, while I was her (paying) guest in Okola[73] (Interview 16-04-2013).

The cooking workshops organised by PROINPA would teach farmers how to cook dishes that - although not traditionally part of the Altiplano diet - were tasty and easy to prepare. Workshops aimed at encouraging farmers to diversify the use of indigenous crops, by cooking

[72] …or the products' economic value, particularly when it came to grains. Quinoa was indeed sold by farmers, as survey data show. This was due to its higher price on the market. In the three fieldwork sites and in the rest of the Altiplano Norte, however, the marketization of quinoa was not as strong and pervasive as in other areas of the Bolivian Highlands like the Altiplano Sur (as discussed in section 5.6). Therefore, the economic value of this product and the relevant market pressures were not so incisive to determine different considerations in agrobiodiversity conservation with specific reference to grains, as opposed to tubers or other products. Grains, in fact, were sold in relatively small amounts (5.5.6) and varieties were normally mixed all together, as I could learn by not only speaking with farmers and scientists, but also observing post-harvest/seed selection and sale activities.

[73] I was hosted by Don Miguel and Doña Roxana in the framework of Okola's community agro-tourism project.

foods that were popular in urban areas and amongst youth. For instance, during a cooking workshop I took part in, farmers learnt how to prepare tortillas and cakes with quinoa and cañahua flour (cachilaya 29-05-2013). They had already learnt how to make chips with native potato varieties and sweet drinks with *pitu* of different grains. In Okola these new dishes and drinks were offered to tourists. In Cachilaya and Coromata farmers prepared them either for selling them in urban events advertised by PROINPA, or for sharing them in special occasions that generally involved the presence of NGO staff or international guests (Fieldnotes 04-2013). I discuss the use and consumption of these dishes in 7.2.3.

5.5.4 "Diversity-minded farmers": collectors of agricultural varieties

Some farmers, defined by NGOs as "champions" of agrobiodiversity (IUCN and CEESP 2010), conserved an extremely large range of crop varieties and stood out for owning a real collection of seeds and holding considerable knowledge on varieties' uses and agronomic characteristics. Although a part of the literature identifies the elderly as those who hold most diversity and traditional knowledge in rural communities (Madebwe et al. 2005), in the Titicaca region it was mainly middle-aged women - wives and mothers - who maintained the richest diversity.

Pictures 5.8 and **5.9:** The seeds of Doña Patricia, a "champion" of agrobiodiversity, one month before sowing time

Cachilaya 27-09-2012.

They did it because they "liked it" (Interviews 27-09; 15-11-2012). Like all collectors, they enjoyed owning varieties of different shapes and colours, they treasured rare varieties and acquired seeds through different channels (purchase, barter, NGOs) to increase their assortment. Doña Patricia from Cachilaya, for example, owned about 120 varieties of seeds, among which 90 of *papa* (Interview 27-09-2012). Pictures 5.8 and 5.9 show the diversity she

owned. Doña Elizabeth, instead, just above 40 years old and mother of five, was the only person in Coromata who owned over 10 varieties of cañahua, which she treasured proudly. Both Patricia and Elizabeth could be defined as "diversity-minded" (Sthapit et al. 2006) collectors. They had developed - because of their propensity to collect varieties - a special relationship with PROINPA agronomists.

5.5.5 The agrobiodiversity "show": social prestige and external recognition through conservation

Farmers are often defined as "spontaneous custodians" of agrobiodiversity (Iriarte, Condori, Parapo, & Acuña, 2009, p. 11). Agrobiodiversity "champions" of the Titicaca region have collected agricultural varieties for many years out of their own will, interest and dedication. Nevertheless, since organisations like PROINPA have started to work in rural villages, some new circumstances pushing smallholders of the Altiplano to preserve their agricultural varieties have emerged. Farmers are proud and willing to "show off" the agrobiodiversity they conserve.

In Coromata, Cachilaya and Okola owning a large number of agricultural varieties and holding relevant knowledge was indeed a way of gaining visibility with scientists and NGOs' staff. On one hand, this meant for farmers to be granted 1) special consideration and a preferential treatment by NGOs, based on a personal relationship of trust and friendship with scientists; 2) particular attention to their agricultural and non-agriculture-related needs; 3) improvement of their social status within the community, because of the prestige deriving from the closeness with urban-based organisations bringing agricultural, economic and human resources for the benefit of the community.

On the other hand, standing out in the eyes of scientists meant becoming the people who experimented new agricultural varieties before others; got involved in new initiatives (in conferences and events, in trips to other communities, to La Paz and to other cities of Bolivia, or even abroad); acquired a position of leadership within the community when the activities conducted in the framework of NGO-sponsored projects were implemented; and ended up being the contact/reference farmers that NGOs and researchers would turn to in the village. I inadvertently was the connection between Doña Patricia from Cachilaya and FAO. Thanks to her charismatic personality, her exceptional conservation skills and agrobiodiversity-related knowledge (and to my accidental mediation), she was invited to attend a conference in Paraguay in January 2015. Gaining enormous prestige within the community, she was the first

of her village to be paid for travelling to a foreign country, leaving Bolivia and taking a plane for the first time in her life.

Picture 5.10: "*Día de campo*" organised by PROINPA; **Picture 5.11:** Farmers show their *pitu de cañahua* to the representatives of a potential donor organisation

Cachilaya 13-03-2013.

Coromata Media 15-02-2013.

Owning a rich agrobiodiversity patrimony and associated knowledge also meant for farmers to participate in agrobiodiversity fairs and, possibly, win prizes. Agrobiodiversity fairs were enjoyed and requested by community members not only because of the possibility for participants to be awarded with material goods, but also because they were joyful social moments and public events that attracted the attention of the whole village population, local authorities, and external people and organisations. While observing and taking part in their preparation and in the actual events I could see how important these were in the eyes of farmers, who were extremely excited to participate. They would repeatedly ask me if I would be there and remind me who had won the previous year. Agrobiodiversity fairs were indeed a reason of pride for the farmers showcasing their products and for the communities hosting them. They were seen as an opportunity for gaining visibility within the municipality and beyond. In Coromata, for example, farmers on the day of this event were introduced to foreign researchers and development workers and to chefs who worked in urban restaurants. They were interviewed by the press (picture 5.12). The lady who won the first prize in the category "agricultural diversity" was interviewed by the Radio San Gabriel, very popular in the whole Altiplano region because it broadcast in Aymara and dealt with topics of great interest to the rural population (i.e. agriculture and cattle breeding, stories of individual farmers, description of festivities, general news from the Altiplano area, etc.).

Pictures 5.12 and **5.13:** The agrobiodiversity fair in Coromata - category "*variedades de semilla*"; a participant interviewed by the press

Coromata 05-09-2013.

Agrobiodiversity fairs were proposed by NGOs in the framework of internationally funded projects, based on the idea that they created public awareness about the value of biodiversity, encouraged farmers to retrieve varieties and exchange seeds and knowledge with each other, allowed scientists to identify agrobiodiversity "champions" and rare varieties, and - most importantly - provided farmers conserving agrobiodiversity with social recognition. I also saw the latter as an important "incentive" pushing farmers "to grow and cultivate diverse crops, and also to share their knowledge with other community members" (Amend et al. 2008, p.135). "Why do you keep so many varieties?", I asked a woman from Cachilaya, who conserved above one hundred. "To participate in the *feria* (i.e. agrobiodiversity fair)" she said proudly, "last year I won the first prize" (Interview 27-09-2012).

5.5.6 The market as an incentive for conservation

The literature acknowledges that "indigenous farmers often face an "economic dilemma" because of the lack of incentives to preserve agrobiodiversity. Sometimes, the "custodians of the global genetic portfolio are not compensated by current […] markets" and "the most profitable decision is often to grow only a few crop varieties, and not to invest in conservation of the varieties that are less 'favoured' by the market" (Kontoleon et al., 2009, p.4). The

benefits of agrobiodiversity for both farmers and the broader society are increasingly recognised, but markets generally underestimate the value of these resources, creating a disincentive for farmers to engage in conservation practices (6.4.6). As Sthapit et al. argue, though, "while it is true that, in general, market forces tend to "homogenize" or reduce diversity due to specialization in high-value products and therefore specialization in only those species and varieties that produce these products, there is increasing evidence from current work on under-utilized crops […] that these same market forces can be used to conserve agrobiodiversity" (Sthapit et al. 2006, p.57). In this spirit, NGOs, in the framework of broader international initiatives, work to enhance the "value of local crop diversity by increasing access to information and materials" and the "demand of local crop diversity" through the development of more appealing products and marketing (*Ibidem*; 7.2.3).

As shown in 5.4.1 ("*Seed acquisition through the market*"), farmers from the Altiplano Norte did not usually sell big portions of their agricultural produce in markets. On the contrary, they used crops for self-consumption and recurred to selling only in case of need or of exceptionally abundant harvests. Because of the intervention of PROINPA, however, and following the creation of producers' organisations like APROCA and ADAMA[74], farmers of Cachilaya and Coromata had learnt how to make their agricultural varieties appealing to potential buyers, and increased their contacts with the market and their awareness of selling opportunities. This had turned into an economic incentive for them to conserve agrobiodiversity.

In these communities the contacts established during agrobiodiversity fairs would often turn into concrete opportunities for farmers. Thanks to the intermediation of PROINPA, APROCA and ADAMA members were invited to participate to the "*Feria Tambo*", a gastronomic fair that gathered, in October 2012, Bolivian producers coming from the whole country in La Paz. On this occasion representatives from the two farmers' associations advertised and showcased their crop varieties, and sold tubers, *pitu* and the food they had prepared (*queques*, *humintas*, *tortillas* etc.) to urban visitors of their stand. In the framework of the same event they participated to a "*rueda de negocios*" (business forum, see 5.6).

Through the mediation of PROINPA, native agricultural varieties were sold to chefs and urban buyers. High-level chefs showed interest in buying *papa* and quinoa varieties with a peculiar taste, texture or colour. They used them to create new visually and gustatory appealing dishes for the Bolivian upper class. Furthermore, some fair trade shops and cafes of La Paz requested native "locally grown/organic" products from Altiplano farmers, especially quinoa and

[74] Both associations emerged with the aim to grant to farmers' families the possibility to sell their products on fair terms, benefitting from business opportunities they could not even take into consideration if they approached the market individually.

cañahua. For example, the popular chain of coffee shops "Alexander Coffee", whose regular customers were the wealthy white and *mestizo* youth of La Paz and tourists, bought quinoa from the association APROCA for one year (Informe SINARGEAA 2009; see also 7.2.3 and 7.4.1). The agreement between the association and the company was signed in 2008, but it was not renewed when it expired because of the lack of interest of the farmers in a demanding business that required too big an effort on their side. Their inability to grant, on the long term, a timely submission of quinoa supplies due to the uncertainty of their production proved to be an insuperable obstacle (Fieldnotes 11-09-2012).

Commercialisation opportunities, anyways, emerged as another important incentive for farmers to conserve agrobiodiversity. The existence of buyers for specific native products was indeed an attractive perspective for some individual farmers, particularly young people, who were eager to learn about and get involved in new business partnerships (Fieldnotes-04-2013; 7.3.1).

5.5.7 The agrobiodiversity business: conservation as part of income-generating projects

Okola was an exceptional case. Here, new business opportunities were exactly what had encouraged farmers to value, retrieve and maintain agrobiodiversity. In the framework of agro-tourism, agrobiodiversity was promoted as one of the main attractions that this village offered, and given great visibility in the community itself, online, and in guidebooks (7.3.1).

Farmers preserved crop varieties for similar reasons as in other Altiplano *microcentros de diversidad*. Thanks to the agro-ecotourism project, however, agrobiodiversity was not only perceived as having a crucial agronomic and consumption-related value, but also as a distinctive characteristic of Okola that attracted tourists and, therefore, income. Many of them spoke of agrobiodiversity as an asset that it was worthwhile maintaining more consciously than other Altiplano smallholders.

I identified agro-ecotourism as a very effective incentive for conservation. However, a series of dynamics made tourism-related interests and agrobiodiversity conservation clash with each other, as 7.3 will discuss in detail.

5.6 The Altiplano Norte: the last bastion of subsistence agriculture in Bolivia?

Different conditions, trends and challenges exist in the agricultural sector across the Bolivian territory. Within the Bolivian Altiplano itself the nature and the scope of agricultural practices

vary between the Northern and Southern part. Analysing the role of agriculture in the Altiplano Norte and in the Altiplano Sur, by drawing a comparison between the main characteristics of agricultural production in these two regions, is useful for understanding the broader context in which smallholder farmers of Lake Titicaca operate, as well as the relevance of certain issues in rural communities.

A series of factors mark the difference between the Northern and the Southern Altiplano agriculture today. I present them below by using the information I retrieved through archival research in La Paz, interviews with scientists and farmers, a survey and participant observation.

1) Farmers of the Altiplano Sur own relatively large quantities of land, as natural (environmental and morphological), legal and economic conditions allow this. While in the Altiplano Norte plots are necessarily small, because of the type of soil and the hilly nature of the territory, in the Altiplano Sur they are much bigger. In the North farm size is also limited. Land fragmentation is overall a pressing problem in Bolivia with agricultural plots, as well as farms, becoming smaller and smaller when land is transferred to heirs after the death of the owner (4.2.3). However, while in the Altiplano Sur families, on average, cultivate up to 10 hectares each, and own the same quantity of fallow land, in the Altiplano Norte they generally own 2 or 3 hectares of productive land with plots reaching an average size of $1000m^2$ to $2000m^2$ (Survey data and data from PROFIN 2013).
2) In the Altiplano Sur it is possible for farmers to produce a quantity of crops that is enough for both consumption and sale. Products are sold through intermediaries, who channel them to the local or the international market. In the Altiplano Norte, instead, agricultural products are rarely sold. While cheese is regularly sold, *papas*, quinoa, *chuño* and *tunta* are only sold occasionally and in small quantities (4.2.2).
3) Given its physical and socio-economic characteristics, the Altiplano Sur is currently at the centre of the so-called "quinoa boom". This Andean grain has recently gained enormous popularity in Bolivia and, most importantly, abroad. It is now highly requested on the international market, and its price has increased significantly. According to Avitabile's research, most land in this region is now used for quinoa. The transformation has occurred over the last 20 years, encouraged by the possibility to generate very high revenues through the quinoa business (Avitabile, personal communication 02-2014).

4) As a result of the previous points, production in the Northern Highlands is almost exclusively devoted to subsistence and it is conducted on a small scale. In the South, instead, most production is generally for sale and, increasingly, for exportation.

Important changes have occurred in the Altiplano Sur as part of the transformation described above:

1) Due to the "quinoa boom", the value of land has increased, as well as the conflicts over agricultural plots. This is shown by the rejection of many *residentes*, who used to be well perceived in indigenous villages, because of their wealth and their useful connections with urban areas. Today, their long absence and scarce involvement in community life is increasingly causing the expropriation of their land, which is reassigned to those farmers who reside in the village permanently.
2) A wave of return migration has begun. After a period as migrants in cities like Oruro, Potosí, La Paz and Cochabamba, and to foreign countries such as Chile and Argentina, many Altiplano Sur farmers, particularly youth, decide to go back to their community of origin, eager to participate in the quinoa business.
3) Production is still to a great extent in the hands of small-scale producers, but farmers are increasingly getting together in cooperatives.
4) Selling quinoa has determined an increase in incomes, better living conditions for families, education opportunities for children, and more diversified diets with the possibility of purchasing fruit and vegetables that cannot be grown in Altiplano farms. However, the increasing specialisation in quinoa has generated vulnerability due to price volatility. Furthermore, different degrees of access to credit and ownership of technology determine inequalities amongst producers.
5) Agrobiodiversity is being lost. According to Jarvis et al., when "agriculture intensifies and becomes commercialized, farmers tend to specialize in the crops and varieties that they can sell for a profit on the market, gearing their choices toward the tastes and preferences of distant urban consumers and buying what they need for their own consumption" (Jarvis et al. 2000, p.17). By following this line of reasoning, economic development leads to a decrease in agricultural diversity, an increase in the size of farms and a progressive urbanization. Although numerous native and non-native varieties are grown for farmers' consumption, in the Altiplano Sur production is increasingly focused on quinoa. The cultivation of this crop is also restricted to a narrow range of varieties. What emerges from Avitabile's study, conducted in the Uyuni region, is that the varieties of quinoa that are the most requested on the market

- *Blanca*, *Phisanqalla* and *Pandela* - occupy today more than 75% of the total land. Very little quinoa is consumed by farmers, who in the past would eat it daily and in every meal, but now prefer to sell it (Avitabile, personal communication 02-2014; Semi-structured intervies with UMSA and PROINPA researchers 2012-2013).

Digging further into the depth of the changes happening in the Altiplano Sur and the possible consequences of the "quinoa boom" in Bolivia is beyond the scope of this thesis. However, sketching a comparison between the two parts of the Altiplano serves the purpose of clarifying the nature of agricultural production in the Northern Highlands in relative terms, and of situating the agricultural activities of small-scale farmers of the Titicaca indigenous communities in the broader context of transformation of the whole Altiplano region.

During my fieldwork, agronomists from UMSA, PROINPA and INIAF often debated whether what is occurring in the Altiplano Sur can and will happen in the Altiplano Norte as well. Most of them argued that 1) the Altiplano Sur is at the preliminary stages of a transition to industrial agriculture; 2) it seems unlikely that the radical agricultural conversion and production expansion in response to international market forces occurring in the Altiplano Sur will be replicated in the North in the near future; 3) the Altiplano Norte does not present the geo-physical conditions for an intensive production of quinoa for internal selling and exportation (Fieldnotes, *Congreso Científico de la Quinua* 14-06-2013 [75]). A PROINPA agronomist emphasised that in the Altiplano Norte land is relatively scarce and fragmented, and an expansion of the agricultural frontier is impossible. Individual households rely on a limited production, which is used almost entirely for self-consumption. There is little use of technology and crops are extremely prone to adverse climatic events, pests and diseases (Semi-structured interview 04-12-2012). This was confirmed by my observations in rural communities, as illustrated earlier on in this chapter.

The Altiplano Norte is indeed undergoing a deep transformation. As I explained in chapter 4, a trend towards an increased commercialisation of agricultural production and a diversification of livelihoods in favour of non-farm activities is observable in this area. An entrepreneurial mentality, familiarity with the market, connections with urban buyers and experience in commerce increasingly characterise Aymara farmers, as a consequence of migration and of more intense connections with cities. Furthermore, like in the Altiplano Sur, the private consumption of quinoa has decreased in recent decades, because of unsure production due to

[75] The Congress was organised by IICA, the Inter-American Institute for Cooperation on Agriculture, and held in La Paz.

climate change and high market prices. Lake Titicaca farmers sell quinoa, which generates high revenues. However, the extent to which the commercial value of quinoa is influencing farmers' choices in this region is by far inferior with comparison to the Altiplano Sur (Avitabile, personal communication 02-2014).

In Cachilaya and Coromata smallholder producers had gathered in associations - APROCA and ADAMA. Nevertheless, despite acting as a group, farmers lacked a strong entrepreneurial capacity; minor conflicts often arised among members; the consolidation of the associations was slow due to the irregular participation of some families. Furthermore, farmers' associations experienced enormous difficulties in providing intermediaries and buyers with a regular and timely supply of produce. The unpreparedness of APROCA and ADAMA farmers to respond promptly to the requests of potential buyers and business partners surfaced clearly during the *Rueda de Negocios* - a business forum with several roundtables, organised in a prestigious hotel in the centre of La Paz in October 2012, in the framework of the "*Feria Tambo*". Encouraged by PROINPA, four representatives of the two farmers' associations of Coromata and Cachilaya participated with the purpose of meeting potential partners interested in buying quinoa and cañahua from their communities. The impossibility for the four farmers to predict the availability of the crops on the date proposed by companies for the transaction, and their difficulty in establishing an exact price for the produce made any attempt to conclude a deal fail. "*No sabemos cuánto va a producir este año"* ("We don't know how much production we are going to have this year"); *"Quiere que le entreguemos en La Paz? A ver si es posible…*" (Do you want the produce to be delivered in La Paz? We'll see if that's possible…"); "*El precio de la quinua lavada…?"* ("Do you want to know the price of rinsed quinoa…?) were some of the farmers' hesitant reactions to their interlocutors' questions during the event. The four of them seemed to be doubtful about the information they should give: their production changed every year due to climatic conditions, pests and diseases; the associations were not structured according to a hierarchy, so taking decisions on the spot was difficult for representatives without consulting with the rest of the members; overall, APROCA and ADAMA had little or no previous experience with regular and demanding buyers. Finally, although the four farmers at the *Rueda de Negocios* seemed to be comfortable in an urban business context, they experienced serious difficulties in adapting to the logic of big companies from the formal sector (Fieldnotes 11/15-10-2012). Scientists did support farmers' associations to strengthen their production and marketing capacities, and to find good selling opportunities. Nevertheless, associations like those of Cachilaya and Coromata, mushrooming

in the Altiplano Norte region[76], did not show to be solidly reliable or independent from external funding and NGOs' technical support.

5.7 New identities between the rural and the urban: a novel perception of agrobiodiversity

5.7.1 The revival of native crops through the involvement of civil society and institutions and through discourse

Along with the rediscovery of the country's indigenous roots, native crops, once neglected and disregarded, have been recently assigned a new value in Bolivia. Under the push of international organisations and of the current political leadership, consumption of traditional foods based on locally grown native products is no longer seen - at least in discourse and by urban elites - as a reason for shame and social exclusion. On the contrary, it is considered as a choice that is wise from the point of view of health and nutrition, and beneficial for the national economy. Eating local tubers and grains is associated, in the dominant rhetoric, with the celebration of the country's indigenous roots, now given considerable space by government and civil society.

Quinoa provides an obvious example of this revival. Not only agronomists, but also people I spoke with in La Paz, agreed that it was once considered the grain of the poor. However, quinoa is now popular in Bolivia and fashionable abroad. It has always been widely consumed by indigenous producers in the rural areas of the Altiplano. The prevailing urban narrative - a researcher from UMSA told me - recounts that the Spaniards, after the conquest, prohibited the consumption of quinoa and attempted to replace this grain with wheat and other cereals imported from Europe, both in the fields and on the table. Wheat, in particular, was considered to have a sacred value because of bread being - in the religion of the *conquistadores* - the body of Christ, eaten in the Holy Communion. Quinoa, on the contrary, was despised for being the food of the "inferior" indigenous people (Semi-structured interview

[76] In Cachilaya, Coromata and Okola there was a farmers' association in each community (APROCA, ADAMA, ASITURSO). In 2014 PROINPA promoted the creation of an "*Asociación Procesadora de Productos Orgánicos Andinos*" involving farmers from different communities of the Altiplano Norte. The annual report of a programme sponsored by the Swiss Cooperation recommended the creation of producers' associations in the Altiplano Norte, as a way of promoting business ventures that make farmers' activities more rewarding, and ultimately lead to an improvement of indigenous people's living conditions. Within the framework of the programme "Training for production, employability and equity in rural communities of Bolivia", the formation of several associations was promoted in the municipality Jesús de Machaca, La Paz department, in particular an association of milk and diary producers, an association of food sellers, a farmers' association, and an association of textile and pottery artisans (PROCAP-CEE 2010).

12-09-2012). According to a woman of Aymara origin - living in La Paz and working as a housemaid in the home of an upper class family - urban dwellers never considered this grain as a staple in their diet. However, she said, "quinoa is requested more and more in cities, because it is one of *the* Andean products and it is known for being highly nutritious. […] In La Paz –you wouldn't find much quinoa twenty years ago. Today it is no longer uncommon. You can get quinoa soups or quiches in the menus of upper class restaurants" (02-06-2013; 7.4.1). The price of quinoa in urban markets is not at all competitive if compared to pasta or rice, due to its high demand on the international market. In 2013, in the urban areas of the Altiplano, the price of 1 kg of quinoa was 51.20 Bs. in a supermarket and 38 Bs. in an open-air market. The price of rice, instead, was 9.80 Bs. per kg, while pasta cost 17 Bs. (Fieldnotes 2013). The average urban dweller does not buy quinoa frequently. Nevertheless, it was evident to me - while living in La Paz - that in the city quinoa was enjoying a growing popularity not only as food but also as a topic for conversation. By doing fieldwork in 2013 - the International Year of the Quinoa (below) - I could observe how a discourse around this product had emerged. It celebrated 1) quinoa's nutritional value; 2) the importance of its production for the improvement of the national economy; 3) its cultural and symbolic value (Fieldnotes, *Congreso Científico de la Quinua* 14-06-2013; Feria Tambo 13-10-2012).

This discourse, however, was not homogeneous. On one hand, the strong political and ethnic component of the revival of native crops prevailed (class-based and ethnic struggles overlap strongly in Bolivia, as discussed in chapter 2). Within it, recriminations were raised about the impossibility for the farmers involved in the "quinoa boom" to take proper advantage from the sale of quinoa and its high demand on the international market. "*Lo mejor se vende y lo peor se come*" ("The best is sold and the worst is eaten"), the Vice-Minister for Agriculture and Rural Development Victor Hugo Vásquez Mamani summarised, with reference to the quinoa production of Bolivian smallholders, during the Scientific Congress of Quinoa. Speakers at the Congress agreed that very often smallholder producers were not the main beneficiaries of the quinoa business, largely managed by bigger companies that drew most of the revenues[77], and that crop conversion to quinoa and technology ended up transforming agricultural landscapes to the detriment of the farmers.

On the other hand, the economic dimension was emphasised. During a conference at UPB, which I attended together with my research assistants from Irfoss, economists argued that the increase in quinoa production and exportation provided a potential component to the

[77] There is a considerable difference between the price of quinoa in La Paz and Altiplano Norte farmers' earnings for selling it. APROCA requested between 9 Bs. and 5 Bs. for 1 kg, depending on the season and the harvest.

economic take-off of Bolivia. Law 98, approved by the Government in 2011, declares that quinoa production, industrialisation and commercialisation are a national priority in those regions of the country that are suitable for this crop. In UMSA a significant part of academic research in the faculties of Agronomy and Economics was centred on technology and productivity improvement, aimed at increasing revenues and overcoming subsistence agriculture (Fieldnotes 04-04-2013; Birbuet & Machicado 2009).

The proclamation of the "International Year of the Quinoa" - following a proposal of the Bolivian President Evo Morales to the General Assembly of the United Nations and his nomination as Special Ambassador for Quinoa - brought with it a series of initiatives linked with agrobiodiversity conservation. Following the thick succession of events during the "Year of the Quinoa" - celebrated, particularly by public authorities, as both an achievement and a springboard for Bolivia - a huge part of the discourse around this grain focused on "the role that quinoa's biodiversity and nutritional value play in food security, nutrition, and poverty eradication" (FAO 2013a). Andean grains and Bolivian native agricultural diversity in general gained wide attention at the national and international level.

As a consequence of the government's commitment to promote agrobiodiversity conservation and native crops, the role of indigenous farmers in the preservation of genetic resources received recognition (5.2). Furthermore, Bolivian agronomists pointed out, the funding and the engagement of the public sector, alongside international actors, in agrobiodiversity conservation initiatives increased (Unstructured interviews 30-11-2012).

At the national level, a series of relevant laws were approved. Besides aiming at reforming the agricultural sector in light of a new approach to indigenous peoples and their use of land and resources, these placed a special emphasis on the maintenance of agricultural diversity for reasons of food sovereignty in Bolivia. The *Ley de Revolución Productiva Comunitaria y Agropecuaria*, Law 144 of 2011, for example, highlights the importance of preserving and managing agrobiodiversity. The State itself commits to taking an active role in facilitating the access to genetic resources for production and research, in order to promote food sovereignty in the country. In article 15, for instance, it is stated that the Plurinational State of Bolivia will protect biodiversity as a resource for life systems and natural processes, by ensuring food sovereignty through food safety and people's health; that the benefits coming from the use of genetic richness must be equally shared to protect traditional knowledge; and that genetically modified seeds of Bolivian native species will not be introduced from outside the country.

The overall revival of native crops and agrobiodiversity conservation was reflected in a series of occurrences I observed in the Altiplano Norte. Firstly, in indigenous communities there was

a strong presence of NGOs. They operated in the framework of international initiatives and national native crop and agrobiodiversity conservation programmes, funded by the State and by international donors. In addition, numerous events promoting native agricultural varieties, traditional foods and agrobiodiversity (i.e. "*Feria Tambo*" or "*Biobolivia*" in La Paz) took place during my fieldwork, mostly in urban areas. Indigenous farmers participated, encouraged by scientists (7.2; 7.4). According to a *técnico de campo* from PROINPA, thanks the popular rhetoric reviving indigenous pride, costumes and struggles, as well as native crops - an expression of ethnic and political identity - farmers were more self-confident. Throuogh NGOs and the media they were more aware of the cultural and economic value of what they produced and frequent rural-urban connections made the spreading and incidence of the new discourse and opportunities faster and deeper in rural areas (Unstructured interview 30-11-2012).

5.7.2 Agrobiodiversity conservation in the *cholo-mestizo* mentality: where old and new values and practices coexist

A discourse celebrating native crops and agrobiodiversity and dignifying indigenous smallholder producers has recently become dominant in Bolivian urban areas and by reflex it is spreading in rural areas. Although farmers are gaining confidence and their role in the conservation of agrobiodiversity is now highly valued, many of them, particularly youth, still desire something else - a monetary income, comforts, urban food and wealth, in line with the *cholo-mestizo* way of thinking. As discussed in chapter 4, migration is the choice of many young Aymara people, aspiring to the *cholo-mestizo* lifestyle and striving to improve their conditions. With a loss of interest in agriculture and the depopulation of rural areas, it would be logical to assume that small-scale farming and - along with it - on-farm agrobiodiversity conservation activities are doomed to be gradually abandoned and disappear in the future. This chapter demonstrated how the transmission of seeds and agrobiodiversity-related knowledge is strictly connected with the actual employment of crop varieties. Regardless of gender and age, it is the physical presence in the community and the participation to its collective social and agricultural life that make individuals part of both material and non-material flows linked with agrobiodiversity. Only people who do spend time in the village can access certain channels of genetic resources and knowledge acquisition. Based on these premises, migration seems to mark a future of overall agronomic simplification in Altiplano Norte farms, due to the large number of *residentes*; the little dedication to agrobiodiversity

conservation and varieties' use; the extinction of some channels of seed and knowledge transmission; and, ultimately, an irreversible deagrarianisation process.

This is, however, not always the case in the Altiplano Norte. Firstly new logics, actors and transmission channels have become established in agrobiodiversity conservation. Secondly, according to the dominant discourse taking shape in Bolivia and the *cholo-mestizo* model, the indigenous culture and way of living, traditional products and foods, and agriculture in general are not despised or rejected. On the contrary, although migration to cities is a widespread choice, a considerable value is increasingly ascribed, discursively and to some extent practically, to rural life and rural products also in the urban context. In conclusion, the phenomenon of rural-urban migration and the emergence of a *cholo-mestizo* identity do not lead exclusively to an abandonment of agrobiodiversity-related work. They also cause a transformation in indigenous communities concerning the composition of agrobiodiversity and relevant knowledge; the main channels through which seeds and knowledge are transmitted; and the reasons for conserving agrobiodiversity. Alongside a scenario of agrobiodiversity loss, one of agrobiodiversity "reinvention" takes shape. The next chapters analyse these two processes.

6. From agronomic diversity to simplifying choices: Moving towards agrobiodiversity loss?

6.1 Introduction

In this chapter I gather the arguments and evidence that demonstrate that a widespread agronomic simplification is an existing threat to agrobiodiversity in the Altiplano Norte. I analyse the mechanisms that make agrobiodiversity loss a possible future scenario; discuss how this trend is included in the deagrarianisation framework examined previously; clarify how migration fits into the picture of progressive abandonment - on the farmers' side - of conservation activities, or of agriculture altogether.

I begin by discussing the status of on-farm conservation, which scientists have recently started to monitor systematically in the Bolivian Highlands. Then I illustrate the direct consequences of rural-urban migration (particularly depopulation) on rural villages and farmers' choices. Finally, I analyse the indirect changes caused by migration as part of a broader socio-economic transformation.

I engage with publications that explore the influence of different socio-economic, agronomic and environmental factors on producers' decisions and on the agrobiodiversity conserved on farm. However, my analysis relies mainly on the primary data that I collected in Cachilaya, Coromata and Okola. To do so I used participant observation during different moments of the crop year; unstructured and semi-structured interviews with farmers and *residentes*; focus groups and survey data. My analysis also includes (especially in 6.4.6) the results of participant observation and unstructured interviews in La Paz and El Alto, particularly in urban markets. Finally, it draws from the secondary material I retrieved in the municipalities' offices (PDMs) and in international and Bolivian NGOs and research institutes (i.e. Rojas et al. 2014; Sthapit et al. 2014; Bioversity International 2012; Mamani Alvarez 2011; Padulosi et al. 2011; Torresin 2010; Avilés Irahola 2009; Rojas et al. 2004; Tapia et al. 2004).

6.2 Is genetic erosion occurring in the Altiplano Norte?

Genetic erosion is the "loss of genetic diversity between and within populations of the same species over time, or reduction of the genetic base of a species" (Jarvis et al. 2000, p.7). With reference to *in situ*/on-farm agrobiodiversity conservation, it is "the loss of crop genetic

resources such as the rare genes and gene complexes often found in locally adapted landraces" (Van Dusen 2005, p.63). The literature reveals that worldwide there are different causes for the loss of landraces by smallholders. Biotic stress is one of them - deforestation, desertification, soil erosion, and climate change (Bioversity International 2012). Another one is what Zimmerer defines as "decommittal (reallocation, reduction, or elimination of inputs) of agrobiodiversity resources" (Zimmerer 2013, p.1). Agricultural modernisation is often considered as the main factor responsible for this (Davari et al. 2013; Velásquez-Milla et al. 2011; Pascual et al. 2011; Subedi et al. 2003), although some authors disagree with this stance (Brush 1992; Van Dusen 2005; Wood & Lenne 1997). Van Dusen, for example, argues that while the competition between traditional and improved varieties of the same crop can affect genetic resources conservation, labour market dynamics - including non-farm work and migration - generally influence the cropping decisions of farm households to a much greater extent (2005). In addition, cultural erosion can be another possible cause of genetic erosion, as the conservation of agrobiodiversity on farm is strongly linked with the maintenance of traditional knowledge (Velásquez-Milla et al. 2011; Sthapit et al. 2006; Mamani et al. 2010).

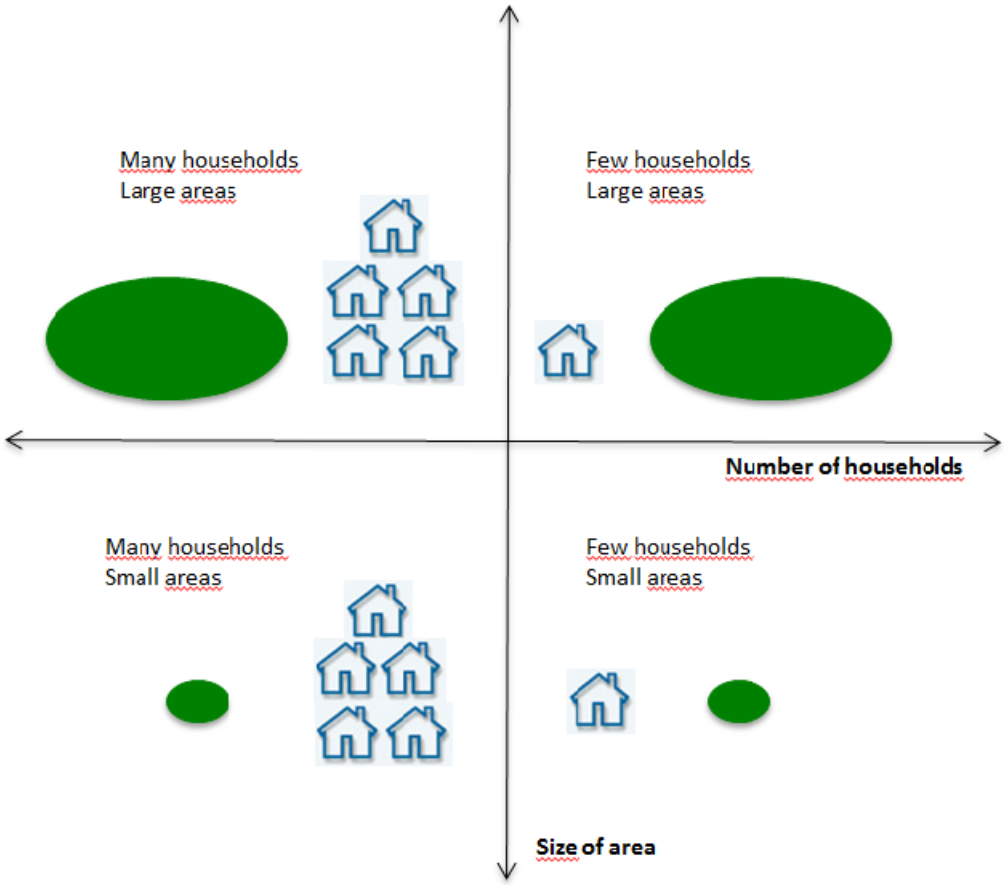
A number of regional studies from the Andes identify a clear acceleration of genetic erosion (Clawson 1990; Bioversity International 2012; Tapia et al. 2004; Velásquez-Milla et al. 2011; Gruberg et al. 2013), caused by low market demand, low profitability, limited availability of arable land, growing preference for other species, abiotic and biotic problems, low availability of quality seed (Bioversity International 2012, p.9 of Apendix G). Nevertheless, some authors argue that this trend is not currently in place for *papa* (de Haan 2009; Hermann & Heller 1997), and claim that further research is necessary to confirm its existence and understand its underlying processes.

In the Altiplano Norte agrobiodiversity loss is reported in several studies as a serious risk, caused by climatic and environmental, as well as by social and economic factors. None of them, however, quantifies this loss, as collecting the data that allow scientists to do this is an extremely complex and lengthy process that requires a systematic effort (Mamani Alvarez 2011; Rojas et al. 2014; Torresin 2010; Rojas et al. 2004).

In the Lake Titicaca region PROINPA scientists have recently started to work to assess the amount and distribution of crop diversity in farming communities. This has been done according to the four-cell analysis (*análisis de los cuatro campos*), a participatory methodology for understanding the status of diversity and, if repeated over time, the rate of loss in a specific area. This technique aims at identifying 1) the richness and evenness of inter- or intra-specific diversity; 2) the common, rare and endangered species or varieties; 3) the reasons that

determine agrobiodiversity loss (Padulosi et al. 2011; Sthapit et al. 2014; PROINPA's Annual Report for IFAD NUS III 2012).

Graph 6.1: The four-cell analysis



Own elaboration from Sthapit et al. 2014.

In Coromata and Cachilaya farmers were invited - in the framework of participatory workshops held on 31 May 2012 and 8 June 2012 respectively - to collectively decide where to locate seed varieties according to the four cells shown in graph 6.1. Each cell combines size of the area used for each variety (large or small) and number of households conserving it (many or few). The seeds that are placed in the upper left cell will be the most common, while those that are placed in the lower right cell the most endangered. Furthermore, according to PROINPA's Annual Report for IFAD NUS III from 2012, in Coromata and Cachilaya farmers were asked to fill in a fifth cell with the names of the *variedades perdidas* (lost varieties). The process was repeated twice - to assess the status of cultivated species the first time, and of potato varieties the second time. Table 6.1 shows the status of *papa* diversity that emerged from the five-cell (four plus one) analysis in Coromata. During the seminar "Managing on-farm agrobiodiversity"

in the offices of Care Bolivia PROINPA scientists declared their intention to carry out this type of evaluation more regularly in Altiplano Norte communities in order to trace the trend of agrobiodiversity conservation in this region (Fieldnotes 22-10-2012). At present, as explained in 3.3.2, reliable data on the trend of agrobiodiversity do not exist.

Table 6.1: *Papa* varieties classified according to the four-cell (plus one) analysis in Coromata

Cell	*Papa* varieties
Large areas - Many households	Huaycha, Wila Imilla
Large areas - Few households	Janqu Pala, Wila Pala, Chiji Pala, Pala Morado
Small areas - Many households	Chiyara Surimana, Chiyara Surimana Muruku, Chiyara Imilla, Janqu Chuquipitu, Ajawiri, Pitikilla Rojo, Chiri Luki, Cuchi Callu, Piñu Blanco
Small areas - Few households	Queta, Manzana Imilla, Sacampaya Negro, Cuchi Jipilla, Morado Chuquipitu, Chiyara Taraco, Sapallu, Wila Taraco, Janqu Imilla, Janqu Kaisalla, Holandesa, Sacampaya, Chuquipitu Nairan Morado, Chiji Yurima, Leke Cayu, Wila Surimana, Koyu, Tonko Puya Blanco, Kaka Surimana, Condor Piqui, Papa Garri Blanco, Papa Chinito, Wila Piñu, Papa Kealla, Pepino, Camara, Kalla Pitikilla, Saitu Luki, Morado Kaisalla, Janqu Ajawiri, Choclito, Holandes Sapallu, Loka, Wislla Paqui, Janqu Polo, Wila Wislla, Chiyara Surimana Largo, Janqu Yurima, Luki Taraco, Sani Imilla, Wislla Wislla, Peruanito, Papa Garri Rojo, Chiyara Isla, Wila Koyu, Yurima, Janqu Sicha, Amajayu, Wila Nairan Peruano, Pureja Blanco, Huancu Callu, Chiji Pitikilla, Tonko Puya, Janqu Pitikilla
Lost varieties	Papa Milagro, Papa Criolla, Morado Kullo

Translated from PROINPA's Annual Report for IFAD NUS III 2012.

6.3 The consequences of depopulation, the most visible effect of rural-urban migration

As several authors acknowledge, in the developing world deagrarianisation is transforming rural societies and landscapes (Bryceson 1997; Pinedo-Vasquez & Padoch 2009; Zimmerer 2010). Through "a process of diversification in economic activities and income sources as well as a change in social identification of agricultural producers", people move increasingly towards non-agriculture-based activities, relocating from the rural to the urban and reshaping livelihoods with an inevitable shrinking and unravelling of peasant communities (Pinedo-Vasquez & Padoch 2009, p.91). In a number of rural settings agriculture is not the only activity at the basis of subsistence and income generation. On one hand, migration is there, causing depopulation and the emergence of "multi-sited households", which live between rural and urban areas (Pinedo-Vasquez & Padoch 2009, p.92). On the other hand, *in situ* urbanisation dynamics (Zhu et al. 2009; Zhu 2004) make farmers adopt urban behaviours and rely on urban sources of income (Pinedo-Vasquez & Padoch 2009). The Altiplano Norte is no exception.

As discussed in chapter 4, in the Lake Titicaca region deagrarianisation manifests through the diversification and urbanisation of livelihoods, as well as with depopulation, which is evident when farmers leave their villages to move elsewhere and the number of inhabitants in Aymara communities drops. During my fieldwork, depopulation was what farmers, scientists and NGO staff would mention the most when speaking about migration. They considered it a serious threat for the continuation of their agricultural and conservation activities and the survival of rural communities (4.2.3). As Zimmerer argues, "agricultural disintensification can undermine […] biological diversity in agriculture by […] eroding the productive capacity needed for farmer variety" (Zimmerer 2010, p.152). Indeed, in the Lake Titicaca region "dentensification" - with a lower involvement of families in farming - occured because of depopulation with consequences on agrobiodiversity conservation. Fewer people translated in less workforce for agricultural activities, especially when youth migrated, leaving their parents alone.

Depopulation in the Altiplano Norte was only apparently a uni-directional flow. Firstly, instances of return migration existed (4.4 and 7.3). Furthermore, connections between urban and rural areas were maintained because most migrants did not abandon their communities of origin for good, but visited them regularly, getting involved in important moments of the crop year together with their family (4.4). While, on one hand, such connections had beneficial

effects for agrobiodiversity conservation (chapter 7), on the other hand, they caused a shift away from farming and simplifying choices in agriculture. The next sections document the second trend.

6.3.1 Agriculture is abandoned

The official data from the Altiplano Norte rural municipalities depict a scenario in which depopulation is occurring as a consequence of migration to the detriment of the region's traditional livelihoods. The PDM 2012-2016 from the municipality of Huarina, where Coromata is located, identifies the "abandonment caused by migration" as one of the factors responsible for the "decline of the productive system, with low productivity levels registered in agriculture, cattle rearing, fishing and tourism" (translated from p.123). Indeed in Huarina the figures concerning permanent migration are alarming from the point of view of the municipal authorities. Huarina has a total population of 8,329 inhabitants, 3,331 of which are *residentes*, who, as the PDM says, "only show up in the community at the time of sowing and harvesting and for the festivals happening in the communities of Huarina" (translated from p.40).

Table 6.2: Number of *residentes* in the municipality of Huarina

Population by place of long-term residency			
	Total	***Residentes***	***Pobladores***
Men	3913	1565	2348
Women	4416	1766	2649 (*****)
		40%	**60%**
	8329	**3331**	**4997**

Translated from PDM Huarina 2012.

(*****) According to this table, there is a gender gap in Huarina's population. This may be due to differences in out-migration or life expectancy. The literature does not offer any explanations for this. The data I collected in this municipality do not provide any relevant insights either.

This means that 60% of the officially registered inhabitants are absent during the majority of the year - a common situation in the Altiplano Norte rural areas.

In the municipality of Batallas, where Cachilaya is located, *residentes* are also numerous and most of them live in the Altiplano's major cities La Paz and El Alto. Furthermore, another phenomenon can be observed here - the emergence of urban areas, which are secondary at the country level, but play an important role locally. A significant share of the municipality's population (3,424 out of the 21,362 total inhabitants) lives in the town of Batallas, the largest

centre of the region. This town has already incorporated the neighbouring Karhuiza, and, according to the PDM, it is going to grow further and become a "minor city in the Altiplano Norte" in the next ten years (translated from p.5, PDM Batallas 2011). Its expansion - the PDM acknowledges - will mostly occur through a resettlement of the rural population of the municipality. In 2012/2013 the town of Batallas was already an important transport hub, it hosted a weekly *feria*, which attracted a large number of buyers and vendors on a local scale, and it had been chosen by several NGOs, whose headquarters were in La Paz or El Alto, as the location for their "rural offices". PROFIN, for example, which worked in the surrounding rural areas, was amongst the internationally-funded organisations that - in 2011 - opened an office in Batallas (I visited it on 25-01-2012).

Since it was common among farmers to consider land fragmentation as a serious issue afflicting Altiplano Norte villages and as a cause of migration from rural areas, it is important to introduce its controversial implications into the analysis of deagrarianisation. As discussed in 4.2.3, according to farmers it was impossible to rely exclusively on agriculture for the sustenance of their family, due to the small size of agricultural plots, and the overall low production. However, it emerged from my interviews that although migration generated concern about the communities' future, it also brought - according to some indigenous people - relief to those who stayed due to the larger availability of land (09-09-2012). "Thanks to migration, many families in the community can benefit from larger plots", told me an UMSA researcher (Interview 28-08-2012). One of the positive consequences of migration, farmers from Coromata declared, was the possibility for non-migrant people to obtain additional land. "*En la comunidad hay parcelas abandonadas que se pueden sembrar. Con el permiso de los parientes podemos usar la tierra de los migrantes*" ("In the community there are abandoned plots that can be used. With the permission of the relatives, we can use migrants' land" - Focus group 03-03-2012). It was not uncommon that those who left for far-away destinations gave up on their land, or that, as in the case Doña Martha's brother, they asked their relatives to take care of it during their absence. In Cachilaya, people like Doña Martha complained about the hard work and preoccupations that derived from managing their family members' plots. However, they enjoyed the fact that they could benefit from larger production and increased wealth (Interview 25-01-2013).

If land fragmentation were the only cause of migration, the out-flow of people from the Altiplano villages should cease with a more sustainable allocation of land and resources. This is not the case. According to the PDM of Huarina, often even those who rely on a large quantity of land decide to leave - "although it is obvious that the *minifundio*

(minifundium/fragmentation) problem is common in the region's communities and it is going to get worse, the people who migrate are not only those affected by land issues, but also those who, despite owning sufficient land, leave the community for other reasons" (translated from p.39, PDM Huarina, 2012).

Research from the Andes identifies a positive correlation between agrobiodiversity and the quantity of owned and cultivated land (Velásquez-Milla et al. 2011). In the Altiplano Norte, however, I was unable to confirm the existence of this connection. Farmers who owned most land were not necessarily those conserving most diversity[78]. Also in the work of Mamani Alvarez (2011) from the Altiplano Norte community Cariquina Grande, while the lack of land is detrimental for families and their agricultural activities, big plots and ownership of a large quantity of land do not necessarily emerge as decisive factors that favour conservation.

As explained in 5.5, in my fieldwork sites agrobiodiversity was conserved due to a number of different agronomic, economic and cultural reasons reflecting the heterogeneity of family situations and the complexity of community life in Aymara villages.

6.3.2 Empty communities attract little public and private resources

Public resources in the Altiplano Norte are allocated to municipalities and, within such entities, to rural communities according to their specific needs. In the spirit of decentralisation and participation, each municipality in Bolivia must ensure that PDMs - that include 5-year plans - are prepared regularly with the support of grass-roots organisations, and that, based on them, POAs (*Planes Operativos Anuales* - Annual Operation Plans) are elaborated (Avilés Irahola 2009). Both PDMs and POAs are instruments of municipal planning and development, and as such they must take population dynamics into account (PDM Huarina 2012 and PDM Batallas 2011). Within each municipality, public financial and physical resources are assigned according to them, and to the issues and requests specifically raised by communities.

In 2012-2013, Cachilaya, for example, was receiving attention from the municipal authorities on different fronts. The municipality, just like with the other communities on its territory, would channel public resources to this village. These were used to satisfy the needs that had been collectively identified at the community level. In November 2012, for instance, I witnessed the assignment of livestock allocation rights during a community meeting. Following

[78] I already discussed in the second part of the section "*The controversial relation between agrobiodiversity and rural poverty*" (3.2.3) the relationship between agrobiodiversity and welfare in the Lake Titicaca region. Ownership of cultivated land was one of the indicators (along with ownership of livestock, number of family members, and non-agricultural livelihoods) included in the definition of welfare. Such indicators were identified through participatory research in the Altiplano.

the decision of the *alcaldía* (the mayor's office) to give the families of Cachilaya a sum of money, community members had decided to use it to buy a few heads of cattle for each household, depending on its size (Fieldnotes 19-11-2012). In addition, in May 2013 the main road crossing the village was improved with public funds, after a sequence of car accidents that led Cachilaya's authorities to present a firm request for urgent repair works to the municipality of Batallas. Despite such interventions, farmers often complained about the lack of services in their village - "*En Cachilaya no tenemos posta de salud. La más cercana está en Puerto Pérez. Se tarda una hora a pie, 15 minutos en movilidad. Nos cobran 2 Bs. pero no hay muchos autos*" ("In Cachilaya we don't have a health centre. The closest one is in Puerto Pérez. We must walk for one hour to get there. Otherwise it takes us 15 minutes by car. It costs 2 Bs. but there aren't many cars that go there" - Focus group 20-02-2013).

To encourage the inclusion of requests in the PDM and a favourable allocation of funds from the municipality, community authorities would use their political and kinship connections, and their persuasion and diplomacy skills. In Okola I found myself involved in a meeting between traditional authorities and a representative from the *municipio* Carabuco. Don Marcelo, the community's minibus driver, and Don Luis, one of the most prominent personalities of ASITURSO, were the most experienced and - because of their job/role - well-connected with people in high places outside their village. They used all their skilfulness and negotiation capacities in the discussion taking place over the construction of a water distribution system in the community (Fieldnotes 04-11-2012; 6.4.4).

Farmers, however, reported that nothing worked in the face of a population drop, which inevitably hijacked resources towards other communities or initiatives. The demographic situation of the villages influenced strategic decisions, taken about the construction and distribution on the municipalities' territory of roads, post offices, medical centres and schools. In Cachilaya some people also complained about the lack of experience and persuasiveness of *residente* representatives. "*El sindicato no logra meter proyectos al POA. Aquí el sindicato está regular, no hace mucho. Ya hay muchos residentes. Con el tiempo puros residentes van a estar en el sindicato. Ahora cumplen una obligación, no hacen nada menos y nada más*" ("The union doesn't manage to have any projects included in the POA. Here the union is average, it doesn't do much. There already are many residentes in the union. In the future there will only be them. Right now, they just fulfil their duty because they must do so, they do nothing more and nothing less than that" - Focus group Cachilaya 20-02-2013).

As explained previously, the inhabitants of rural communities did feel the pressure deriving from depopulation. In 2012 in Batallas there were six schools (the 30% of the total) that would be shut down because of a sharp decrease in the number of students (PDM Batallas). In

Cachilaya many acknowledged that the families permanently living in the community were less than they used to be, and they worried about the future of their village (4.2.2). *Pobladores* would insist that *residentes* returned to their village when important meetings were held, or when the census was conducted (4.4). They realised that because of out-migration, rural communities were destined to undergo a cut in the funding they received, with consequences on farmers' wellbeing and livelihoods. In Coromata, people were well aware of this - "*No hay progreso en la comunidad. Un requisito para obtener apoyo en los municipios es que se cuente con mucha gente. Hay menos gente y no hay apoyo ni con semilla, ni con ganado, o tecnología. No se invierte en la comunidad*" ("There isn't any progress in the community. A prerequisite for obtaining the municipality's support is that there are many inhabitants. There are few, instead, and there isn't any support, neither with seeds, nor with livestock, or with technology", Focus group 03-12-2012), reported Don Juan, a lively farmer in his thirties who wished for a different fate for his community.

Depopulation also emerged as a disincentive for NGOs to work in villages where the demographic situation was such that the success of proposed activities was highly uncertain. At the time of my fieldwork PROINPA had worked in Coromata and Cachilaya for more than ten years, and, thanks to the trust they had gained from farmers, the creation of the producers' associations APROCA and ADAMA, and the interest raised by the initiatives they had launched, the number of people who consistently attended workshops and meetings had gradually increased. However, participants were, with only a few exceptions, elderly people. In both Coromata and Cachilaya there were about 3 or 4 young unmarried farmers who regularly worked with PROINPA, a clear sign that the youth who still lived in the community were not particularly interested in agriculture-related training and events revolving around agrobiodiversity conservation (Fieldnotes 10/11-2012). "*Los jóvenes no participan porque no les interesa. Tienen otras cosas que hacer*" ("Young people don't participate because they aren't interested. They prefer to do other things") said an elderly woman who regularly attended PROINPA's meetings (Fieldnotes 04-10-2012). NGOs and international organisations had left rural villages for different reasons - the completion of their project, the exhaustion of funds, the lack of involvement and participation from farmers. In Coromata people overall did not know why some organisations that used to work there interrupted their activities. For instance, PROSUCO (*Asociación Promoción de la Sustentabilidad y Conocimientos Compartidos*) and FAO, which used to be present with some projects a few years before my fieldwork, were no longer active in this village. Farmers did not directly connect this with depopulation. However, despite speaking of institutional decisions beyond their control, some blamed it on

their own irregular participation, and others even reckoned that due to the lack of young people the long-term success of NGOs' trainings and activities was uncertain (Unstructured interviews 28-11-2012). Furthermore, because of young people's migration, the involvement of the elderly would also decrease. "*Antes iba a los talleres de PROINPA. Ya no voy porque tengo mucho que hacer. Estoy solo. Mis hijas viven en la ciudad. Son profesionales. Yo tengo que atender al ganado, cuidar las parcelas, no tengo tiempo*" ("I used to attend PROINPA's workshops. I don't go anymore because I am too busy. I'm alone. My daughters live in the city. They are professional workers. I must look after the cattle and take care of the plots, I don't have the time", 28-11-2012), complained Don Jorge, a former migrant who had spent most of his life in the city. The fact that he conserved very little diversity was perhaps due more to his long absence from the community, than to his interrupted participation in ADAMA's and PROINPA's activities. However, I met several elderly people who were the only members of their families living in rural communities. This situation challenged NGOs in the planning and implementation of their activities. Indeed, they considered depopulation and the lack of young people in indigenous villages a very serious problem. PROINPA, for example, supported my study on rural-urban migration because of their eagerness to know more about an issue undermining the success of scientists' daily work in the field.

6.3.3 Traditional channels of seed and knowledge exchange fade away and some non-traditional ones are ineffective

Agrobiodiversity has been conserved until today thanks to the activity of farmers transmitting seeds and agricultural knowledge through different inter-generational and intra-generational channels. As chapter 5 illustrated, despite the continuation of traditional practices, new "modern" channels have become established due to the presence of NGOs and the increased physical and ideal proximity of Aymara villages with urban markets.

In their study "*Ecological and socio-cultural factors influencing in situ conservation of crop diversity by traditional Andean households in Peru*" Velásquez-Milla et al. identify a positive correlation between agrobiodiversity and traditional agricultural management. In particular, they emphasise the importance of traditional techniques, mutual help, and seed interchange strategies that maintain seed flow among households, including farmers' efforts to obtain seeds (Velásquez-Milla et al. 2011). Such aspects are crucial for agrobiodiversity conservation in the Altiplano Norte as well. This section will show how migration influences inter-generational and intra-generational channels of knowledge transmission, seed flow and farmers' networks, while also affecting some non-traditional mechanisms.

The "eternal childhood" of permanent migrants

Chapter 5 explained that in the Altiplano Norte people acquire most agrobiodiversity-related knowledge and skills as children and teenagers, thanks to an inter-generational mechanism of transmission, linked with the implementation - year after year - of agricultural practices at the family and community levels. Migrants retain some familiarity with agricultural practices and seed varieties, especially if they visit their village regularly for sowing and harvesting sessions. However, in this section I argue that they have a different consideration for agriculture than their non-migrant peers.

This is an excerpt from an interview with a second-generation woman migrant in El Alto.

"*Yo también tengo tres o cuatro surcos en mi pueblo. Y esto es suficiente para toda mi familia. Se siembra lo que se necesita, no más. En mis surcos sembramos papa, generalmente Huaycha certificada. Mis papás al venirse a la ciudad no se han traído las variedades. Las han dejado ahí en el campo y se han perdido. Tampoco puedo acudir a mis abuelos para que me regalen semilla, hay que comprarla […]. Los que manejan las variedades son los que se quedan ahí. Los que se han ido siembran lo que les conviene, las variedades que rinden mejor, que producen mejor. Para que arriesgarte a otras variedades? […] Hay que darle uso a cada variedad, te cuesta más trabajo. Los residentes tienen que ir a su comunidad y regresar en el mismo día, tanto para sembrar como para cosechar. Por eso escogen una o dos variedades no más*".

"I also have three or four furrows in my village. And this is enough for my family. We sow what we need, nothing more than that. In my furrows I sow *papa*, generally certified Huaycha. My parents, when they moved to the city, didn't bring any varieties with them. They left them there in the community, so we lost them. I can't even go to my grandparents to ask them to give me seeds as a gift, I must buy them [...]. Those who handle varieties [i.e. those who conserve agrobiodiversity] are the people who live in the community. Those who left sow what's convenient for them - the varieties that give better yields, that produce better. Why should you take the risk of sowing other varieties? […] Then you have to give a use to each variety, it means more work. *Residentes* normally have to go to their community of origin and return to the city on the same day, for both sowing and harvesting sessions. This is why they choose just one or two varieties and that's it" (03-12-2012).

By speaking with *pobladores* and migrants, I learnt that - because migrants' life is somewhere else - their participation in the agricultural routine in their communities of origin is occasional. They often delegate the management of their furrows to their family members, who take care of them for the majority of the year (5.4.2). They do not partake in community life and in decisions concerning cattle and plots, having built their family in the city, where their spouses and children live and work (4.4).

"*Los hijos que se van ya no regresan y tienen su vida independiente. Los padres les dejan algunos surcos. De todas maneras no podrían sembrar superficies grandes. Solo se siembra lo que se necesita. A veces los hijos que viven en la ciudad sí traen semilla de la ciudad para sembrarla en sus parcelas. Sus papás se las cuidan. Luego siembran juntos como familia. Pero de sus surcos de los hijos ellos son los que se llevan el producto*".

"The children who leave don't go back to the community and have their independent life in the city. Parents leave a few furrows for them. They wouldn't be able to sow on bigger areas anyway. They only sow what they need. Sometimes children who come from the city bring some seeds from there to sow them in their plots. Parents take care of the plots while they are away. Then they sow all together as a family. But it's the children who take the product of their furrows" (Interview with agronomist 04-12-2012).

In agriculture migrants continue to rely on their parents' knowledge, expertise and genetic material. For example, during a sowing session of *papa* in the plot of an elderly couple in Cachilaya, migrant children were there. They were three young and middle-aged women and men who lived in the city but had travelled to the village with their spouses on that day to help their parents. They had a role of support to their older family members, whose instructions they diligently followed. Parents decided when and what to sow, they had procured and chosen the seeds, and they assigned tasks (Fieldnotes, participant observation 24-10-2012).
This tendency is confirmed by the words of Don Bernardo from Cachilaya - "One of my sons lives in La Paz, the other one in Santa Cruz. My son who lives in Santa Cruz is a policeman. I go to visit him once a year and I normally take with me *papa* for him. He gives me sugar and pasta in return. He hasn't come back to Cachilaya in almost 20 years. He has his life and his own family in Santa Cruz. He doesn't come over here to help me anymore. The same happens with my other son who lives in La Paz. He has his family there. But he comes here for sowing and harvesting and for the *fiestas*. When he comes here for the sowing I give him the seeds and we sow together" (Interview 25-01-2013).

Migrants, although participating in sowing and harvesting sessions, as well as in the community's *fiestas*, are not present during other important phases of the crop year. For instance, differently than on sowing and harvesting days, I did not see any migrants helping in post-harvest activities such as seed selection or dehydrated product preparation. After the harvest, young migrants would leave, carrying some produce with them for their own consumption. Later on, they told me in Cachilaya, they would receive dehydrated products like *chuño*, *tunta* or *caya* as a gift from their family members without getting involved in their preparation (Unstructured interviews 24-10-2012).

"*Cuando mis hijos vienen de visita les doy papita … Una cuarta arroba. También chuño y tunta*". "When my children come here to visit me I give them a little bit of potato … one quarter of an *arroba*[79]. I also give them *chuño* and *tunta*" (Interview with a farmer from Coromata 03-12-2012).

This turns into a limitation for the mechanisms of intra-generational transmission of agricultural varieties and knowledge.

Young migrants become adults who lead a totally independent life in the city. However, since they mainly rely on non-agricultural livelihoods, they do not transmit to their children - born and raised in an urban area - the agriculture-related knowledge they acquired before leaving their village. It is enough to interact with second-generation migrants to understand that migrants' children, like most city dwellers, do not know much about agriculture. The grandchildren of a couple of migrant farmers from the municipality of Huarina were not at all interested in agriculture, entirely oriented as they are towards a future of personal and professional realisation that was based on a completely urban lifestyle. One of them, a 13 year-old boy born and raised in El Alto, went to school in La Paz and wanted to become a computer scientist when he grew up. Although he enjoyed visiting his grandparents in the Altiplano village where they lived - he told me - he was not at all attracted by a future as a farmer. He did not speak Aymara but he was studying English. His intention after high school was to study at the university, and he dreamt of travelling to Europe one day (Fieldnotes 03-06-2013).

In conclusion, the progressive detachment of migrants and their children from farming ultimately causes an irreversible loss of relevant knowledge and skills. Agrobiodiversity

[79] The *arroba* is a unit of measure used by farmers in the Altiplano. It corresponds to 12kg.

richness and relevant knowledge and skills disappear with the death of migrants' parents. For migrants agriculture had a secondary importance and a mostly utilitarian function. Aspects such as high yields and a good production untouched by pests are valued more than agronomic risk distribution or diet diversification (6.4.1). They see agrobiodiversity as an unnecessary extra.

Residentes' preference for market-based channels

Subedi et al. argue that in a community it is easier for people who rely on strong networks to access seeds, even in adverse conditions (Subedi et al. 2003). As discussed above, migrants do maintain family and friendship ties. However, their networks are less articulate and adaptable than *pobladores*', because of their prolonged absence and sporadic contact with other community members. If seeds are abandoned or lost it becomes complicated for *residentes* to come into possession of the same varieties through traditional channels.

I showed in the section "*Seed acquisition through the market*" (5.4.1) how people who 1) rely on a certain monetary availability and 2) place a higher value on productivity and agronomic resistance than on diversity tend to use the market as a source of seeds. *Residentes* resort to urban shops or fairs to buy "modern" technologically improved genetic material. In this short section I reiterate this point to add to the list of causes of agronomic simplification in the Altiplano Norte agricultural plots *residentes*' urban/*cholo-mestizo* mentality and their use of the market as an almost exclusive channel for seed acquisition. Section 6.4 will elaborate on *residentes*' relationship with agriculture further.

Migrants do not make use of non-traditional agrobiodiversity transmission channels

Non-traditional transmission channels, established mainly since urban-based actors have increased their presence in the region, are in use in the Altiplano Norte ("*New channels*", 5.4.1). NGOs, scientists and tour operators must be taken into account as actors that foster the transmission of seeds and knowledge through both traditional and non-traditional methods by using "modern" inputs and initiatives. Intra- and inter-community seed exchange happens as a consequence of agrobiodiversity fairs, the creation of community seed banks, workshops and trainings organised for farmers, and of the activity of scientists more generally.

During my fieldwork *residentes*, although occasionally present in rural communities, never got involved in NGO-sponsored activities, with a few exceptions registered in Okola, where permanent migrants participated in some meetings organised in the framework of the

successful and lucrative agro-tourism initiative (7.3). Their absence from the community and their commitments in the city made it impossible for them to get involved in NGOs' work. *Residentes* from Cachilaya, Coromata and Okola were not part of the associations APROCA, ADAMA and ASITURSO, did not participate in the community genebank activities or attend agrobiodiversity fairs. They were not there when seeds were given out by scientists, or when PROINPA's workshops took place.

In this section I have shown that deagrarianisation and depopulation overlap when people pull out of agriculture to perform other activities in a non-rural place of destination - what Van der Ploeg calls "deactivation" (Van Der Ploeg 2008). Migrants' participation in the indigenous villages' life and in collective decision-making is low. Agrobiodiversity conservation is heavily affected by 1) the physical lack of farmers, who used to carry out year after year the activities necessary for conservation; 2) the absence of a new generation of seed custodians and knowledge holders; and 3) the gradual shift of resources away from rural villages.

6.4 The indirect consequences of migration: Agrobiodiversity conservation in a "new rurality" context

As explained in chapter 4, in the Altiplano Norte "rural-ness" and "urban-ness" (Thompson 2004; Rigg et al. 2008) have many characteristics in common and agricultural and non-agricultural livelihoods coexist in both rural and urban households. After analysing the direct consequences of migration by focusing on depopulation, I will now discuss the propensity of farmers to make "simplifying" choices (Kontoleon et al. 2009b) in a "new rurality" context (Kay 2008; Rigg 2006; Rigg et al. 2008; Bryceson 2004).

6.4.1 Livelihood diversification: the "alternative type of risk management" that replaces agrobiodiversity conservation

One of the main functions of agrobiodiversity is to provide insurance against agronomic risk (5.5.2). In this section, however, I show how farmers can count nowadays on "alternative types of risk management". These are "an important source of income, savings and investments, as well as a new way to manage risks" that reduces "the necessity of crop diversity to fulfil this role" (Bellon 1996, p.29). In the Altiplano Norte these risk management strategies are non-agricultural activities, performed either in rural areas, or following temporary or permanent

migration. In Aymara communities both migrant and non-migrant households rely on such livelihoods.

On several occasions during my stay in Cachilaya, Coromata and Okola I noticed plots that looked messier than the others, semi-abandoned, with overgrowing weed and small and withered *papa* plants. "*Es de algún residente*" ("It belongs to some *residente*") is the response I was always given by both farmers and scientists every time I asked for information about their owners. I understood quickly that *residentes*' relationship with agriculture and agrobiodiversity conservation was different than *pobladores*'. According to Jackson, Pascual and Hodgkin, "planned agrobiodiversity is the biodiversity of the crops and livestock chosen by the farmer" (Jackson, Pascual, & Hodgkin 2007, p.197)[80]. In rural communities crops in *sayañas* reflected families' basic necessities (5.4), but *residentes*' rationale behind "planning" was different. *Residentes* grew crops as a secondary activity - carried out alongside a primary income-generating one - that granted them a supply of food, covering a part of their family's needs. Their decisions were based on a combination of urban and rural commitments and interests, in which the urban income-generating ones prevailed. For example, in *residentes*' plots there was mostly *papa* (4.4). I asked some of them why this was the case. They responded that firstly *papa* was a staple in their diet; secondly its production was more certain than quinoa's or cañahua's, which needed more care and were more sensitive to atmospheric agents; thirdly it was easily transportable and, depending on the variety, could be consumed directly - after cooking - without any further work (like threshing or washing). Potato "families" like *Imillas* and *Qhatis* were often chosen for this reason (Unstructured interviews with *residentes* in Cachilaya 19-11-2012; and Coromata 24-10-2012). This utilitarian consideration of agriculture as an accessory activity - entailing a narrow scope for agrobiodiversity conservation and a "simplifying" attitude towards it - was also reflected in the words of Doña Rosmery, *residente* from Okola - "*Ya estamos con harto trabajo en El Alto. Hay que hacer rápido, no hay tiempo. Vamos, sembramos papita y ya volvemos*" ("We already have a lot of work to do in El Alto. We must be quick, there's no time to waste. We go to the community, sow the *papa* and go back" - 21-03-2013).

[80] "Planned agrobiodiversity" is the distinctive component of on-farm agrobiodiversity, in which farmers play a fundamental role (Kontoleon et al. 2009a; Zimmerer 2010; Jackson, Pascual & Hodgkin 2007). "Associated agrobiodiversity" is the complementary component, which "refers to the biota, e.g. soil microbes and fauna, weeds, herbivores, carnivores, etc." (Jackson, Pascual & Hodgkin 2007, p.197).

6.4.2 A loss of interest in agriculture in rural communities

In the Altiplano Norte villages farmers - particularly youth - do not see their future as necessarily linked with agriculture. Perceiving urban areas as close and accessible, and migration as a real and viable possibility, induces many farmers to imagine a different future. Young people are attracted by work opportunities outside their communities, and, even within their village, they often take up non-agricultural activities to increase their income. In this section I illustrate - by discussing the case of Okola children - how Aymara people are losing interest in agriculture, which does not produce any income and prevents young farmers from conducting a wealtheir lifestyle.

Rural origins, urban aspirations: Okola children and agrobiodiversity

In April 2013 I lived and worked in Okola, together with a team of 11 Italian researchers participating in a "Workshop of Visual Anthropology and Field Research" sponsored by Irfoss (3.3.2). With the support of the workshop participants I held a cycle of meetings with a group of schoolchildren from this community. In particular, my team interacted closely with the students of fourth, fifth and sixth grade, between 11 and 15 years old, with the purpose of understanding the new generations' consideration for and involvement in agriculture and agrobiodiversity conservation activities, as well as their views on migration.

The meetings took place during school time. Some of them happened in the classroom, and some others outdoors. Some students also received home visits outside school hours. According to our agreement with the director, children participated in a series of activities, such as in-class discussions and monitoring of agricultural varieties in the community's plots. They also took part in a competition with prizes that we launched, in which participants had to find out, by observing their fields and products or asking their family members, which agricultural varieties their households conserved[81]. Finally, they attended some photography

[81] My research assistants and I launched this competition with the purpose of a) understanding teenagers' relationship with agriculture - particularly, agrobiodiversity - and with migration; and 2) involving schoolchildren in our data collection work in an active, participatory and - we hoped - (for them) exciting way. We sought to encourage them to take part in this contest firstly with the promise of a prize for the best "researcher" amongst them and secondly with the announcement that this experiment would be marked as an assignment. This was possible thanks to the support that the director and the teachers had pledged to provide us. Unfortunately, the interaction of the following factors determined its partial failure. To begin with, students were largely uninterested in the topic of the competition, as it is reflected in the analysis that I present in this section. Secondly, the support of the teachers was most of the time lacking. This was due to what we interpreted as low consideration from their part for the assignment we proposed and for our requests, and to their loose approach to homework. Finally and

classes that we committed ourselves to organising. This activity had the final purpose of taking pictures of Okola's livelihoods for the community museum. Through this initiative we also aimed at understanding the students' perception of their own community.

The first consideration that my team and I drew from our experience with young *okoleños* was that they had very little oral knowledge on agrobiodiversity. Speaking about agricultural varieties, their uses and their properties with people of any age was a delicate task in rural communities. On several occasions I realised that conversations rarely did justice to people's knowledge and commitment concerning agrobiodiversity - even less if these occurred away from agricultural fields or homes, and without seed varieties at hand. Furthermore, certain moments and settings (i.e. harvest time, evening) were more suitable than others to obtain farmers' attention. Okola's schoolchildren were approached in different places (i.e. the school, the beach, their homes, agricultural fields), at different times, and through methods ranging from informal conversations, to interviews, visual techniques, participant observation, and written assignments included in schoolwork (Annex 4). This allowed me to triangulate information, methodologies and locations, and conclude that young *okoleños* did not consciously hold, overall, a structured body of knowledge on agrobiodiversity. Unlike older people, they could not handle a conversation on the varieties owned by their families, their uses and characteristics, and they often suggested that my research assistants and I directed our questions to their parents.

By participating in harvest activities with the students' families we noticed that, despite their failure to show a structured and conscious knowledge, youth did handle skills and practical knowledge regarding agriculture. During our stay in Okola they contributed to the harvesting of *papa* and broad bean in their families' fields with supporting roles to their parents.

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releatedly, the quality of education in Okola was poor, as it is overall the case in the rural Altiplano (the provision of good education in rural areas is a serious issue at the country level, as several publications confirm - i.e. Inter-American Development Bank 2011; Punch 2004). Students were neither used to submitting their homework timely, nor concerned about possible punishment for not doing so. Furthermore, they did not fully acknowledge neither our authority, nor - for that matter - their teachers'. Several students did not hand in their assignment. Most of those who did, included very general information that unfortunately was not usable for the purpose of drawing - based on it - a reliable picture of the situation of agrobiodiversity in Okola. There were very few exceptions (I included one of them in Annex 4). The failure of this experiment was for me a reason of reflection and self-criticism. After discussing with my research assistants the misjudgements at the root of the possibly naïve idea of launching a contest, we resolved to switch to a more individual and hands-on approach to obtain meaningful data from our informants. We decided to pay home visits to some of the students and to complement the information that a few of them had provided through interviews with them and their family members.

Our second and related consideration concerned the overall reluctance of young *okoleños* to discuss issues regarding agriculture. Some of my research assistants saw shame in the students' rejection of this topic - shame for their livelihoods in front of us, white and (in their eyes) wealthy Europeans and outsiders; some others saw shyness - in particular, it took us considerable time and effort to overcome the reticence of girls to interact with us; many saw boredom - speaking about something as ordinary as agriculture was indeed not an exciting experience for a group of young farmers. Irrespective of these factors - which undeniably came into play - I would like to emphasise that 1) Okola children did not seem to attribute any particular value to agrobiodiversity, in spite of the fact that Okola's agro-tourism initiative advertised it as one the community's main characteristics and reasons of pride in front of tourists (7.3.1); 2) they showed a complete lack of interest in discussing agriculture.

Our third reflection was that youth in Okola were unquestionably experiencing a strong pull towards urban areas and non-agricultural livelihoods, through which they wished to earn an income and buy modern commodities. This emerged clearly from their open statements, and from a series of behaviours that my research assistants and I noticed during the time we spent with them.

Firstly, most schoolchildren explicitely declared they wanted to leave Okola and find a job in La Paz or El Alto when they grew up. In our first meeting with them, I asked all participants to introduce themselves, giving us some information about their likes and dislikes to brake the ice and get to know each other. I also asked them to share with the group their aspirations for the future, telling us about their plans after finishing high school. As mentioned in 4.2.2, only 2 out of the 24 children who attended this session said they were planning to remain in their community, working in agriculture and community tourism - the lucrative business par excellence in Okola. All the others openly expressed the intention to leave the village, settle in the city and become *profesionales*. Indeed they all agreed they were happy with their lifestyle in Okola. No one complained about working in agriculture with their parents, taking care of cattle, and going to school. Many had words of appreciation for their village and for the lake. Nevertheless, it struck us that such a large majority overtly hoped for a future in the city (Focus group with Okola children 11-04-2013).

Secondly, on several occasions Okola's children showed a tremendous interest in our clothes and technological equipment (i.e. phones, cameras), as well as in some of the food we had bought in La Paz (biscuits and other snacks), and they would continuously ask for information about money and prices (i.e. how much does it cost to travel to Bolivia from Europe?; how

much does your pullover/your shoes/your sunglasses etc. cost?; how much does your hotel in La Paz cost? etc.).

Thirdly, they participated with enthusiasm and interest in our photography classes. As compared with the other activities we proposed, they showed a clear excitement in handling our cameras and walking around the community taking pictures. They were eager to chat about photography and willing to put our lessons into practice. Some of them, in particular, verbalised the desire to earn in the future enough money to buy the same phones/cameras/garments that we had.

The curiosity of the children of a rural village for the lifestyle and the belongings of a group of foreigners might seem unsurprising. However, it is important to note that 1) people of Okola were used to interacting with tourists from the United States and Europe, who often walked around the village, hosted by local families; and 2) the keen interest of Okola students in speaking with foreign people about commodities, money, urban habits and lifestyle clashed with the complete lack thereof when the topic was agriculture.

6.4.3 The shift to "modern" high-yielding varieties

As discussed in 5.3.1, "Andean agriculture has never been a static system, and cultivators have long been able to accommodate new technology". However, since the last century "the pace of change appears to have accelerated" (Brush 1992, p.169). The literature presents contrasting views about the impact that the introduction and adoption of "modern" varieties (Subedi et al. 2003) has on agrobiodiversity conservation. Velásquez-Milla et al. emphasise the negative influence of modern agriculture on the conservation of genetic resources. Indigenous varieties' richness, they argue, is lost because of agricultural intensification and an orientation to commercialisation, which threatens traditional techniques (Velásquez-Milla et al. 2011). According to Winters et al., the introduction of "modern" varieties is only "one mechanism by which rural development processes […] bring about a change in crop biodiversity on farms" (2006, p.147). Other factors - they state - can emerge, and opportunities in new agricultural products can, for instance, cause shifts in land use patterns. In addition, alternative labour uses including non-agricultural activities can lead to genetic erosion more than the mere acquisition of "modern" seed varieties. Brush et al. maintain that the adoption of "modern" varieties leads to a reduction, but not to a complete loss, of household-level diversity (Brush et al. 1992). In his study on Andean potato farming in Peru, Brush also explains that "adopting modern crop varieties often decreases the area that is planted to the traditional and more diverse varieties", but the acquisition of new technology does not lead to genetic erosion, because

"farmer behavior towards traditional crops remains unchanged as improved crops are adopted" (*Ibidem* p.170). The continued presence of traditional crop diversity "may be interpreted as biological evidence of the tenacity of Andean cultural elements in the technological polyculture that has existed since the European conquest" (Brush 1992, p.181; see also Zimmerer 2013).

During my fieldwork, by interacting with Bolivian scientists both in urban meetings and in rural areas, I could retrace the story of the introduction of "modern" varieties in the Altiplano Norte. This practice intensified starting from the 1950s, with scientists and NGOs becoming the main channels through which smallholder farmers acquired varieties of tubers and grains. These were obtained through genetic modification or participatory selection, which involved both scientists and farmers. Although the incorporation of such varieties did not lead to a replacement of indigenous ones, externally introduced varieties were incorporated in farmers' diversity portfolios. In fact, they were extremely widespread in agricultural fields in the rural villages where I worked. Some varieties - for instance *papa Huaycha* - occupied most space in farmers' fields due to their highly appreciated agronomic, culinary and taste characteristics (5.3.1; 5.4).

"*La papa Huaycha es muy querida porque es harinosa y en floración ya tiene tubérculo. Produce rápido. También en el mercado prefieren esta variedad. El precio es bueno*".
"*Papa Huaycha* is very dear to farmers because it has a sandy texture and it has tubers already during the flowering phase. It gives products quickly. People prefer this variety in the market too. The price is good" (Unstructured interview with PROINPA agronomist 04-12-2012).

It did not seem that the inclusion of "modern" varieties in the diversity portfolio of indigenous smallholders was leading to a loss of agrobiodiversity in the Altiplano Norte. It was enough to look at the incredibly rich display of native varieties in agrobiodiversity fairs (an example is given in Annex 3) and the extremely large diversity base conserved in farmers' communities (Annex 1) to see that a decisive shift in this direction had not occurred in rural villages. However, it can be argued that the preference for "modern" varieties combined with other factors (i.e. rural-urban migration and the large number of *residentes*, the gradual weakening of some traditional channels of seed and knowledge transmission, and the pull away from subsistence agriculture and towards income-generating activities) was putting pressure on the conservation of genetic diversity. For example, *residentes* - predominant characters in the Altiplano Norte "new rurality" scenario - would buy "modern" varieties - high-yielding and

resistant to pests and diseases - from urban markets. Given their availability of cash, they could renew seeds frequently, seeking high yields through the continuous purchase of better-performing varieties in the market.

Some non-migrant smallholders from Coromata reported that the use of chemical pesticides and fertilisers was also part of some farmers' productivity-seeking strategy (Focus group 03-12-2012). Chemicals in fact were often used alongside "modern" varieties.

It should be underlined that *residentes* in rural communities were often perceived as innovators and capable people, who, thanks to their urban experience, could take more intelligent and strategically convenient decisions than other farmers. "*Los residentes son más capos, son personas más conocedoras*" said a custodian farmer of Coromata ("*Residentes* are smarter (than us), they are more knowledgeable people" - 03-12-2012). Furthermore, they played an important role in the diffusion of technology. "*Los residentes consiguen insecticidas, productos químicos que hacen producir rápido […]. Los traen de la ciudad*" ("*Residentes* get insecticides, chemical products that make production faster […]. They bring them from the city"). According to scientists, many young farmers, who wished to increase their production, were eager to try such products and imitate what *residentes* did in their fields (Interview with PROINPA scientist 04-12-2012). "*En el futuro va a aumentar el uso de químicos*" ("The use of chemicals is going to increase in the future"), was the opinion of Don Nicolas from Cachilaya. He believed that, while the people who got involved in scientists' work and were part of the association APROCA were progressively reducing their use in favour of natural fertilisers, the other farmers, especially *residentes*, were doing the opposite (Focus group 20-02-2013).

In conclusion, the acquisition of "modern" varieties was not on its own causing agronomic simplification. Nevertheless, it was a contributing factor, especially given the existence of new channels of seed attainment that made it easy for farmers to get "modern" seeds from the market, scientists, NGOs and migrants, along with relevant knowledge.

6.4.4 The leverage of "multi-locational" interests in community life

By discussing a case study from the Amazon, Newing (2009) states that collective decision-making is challenged by the existence of "multi-locational families that maintain households and economic activities in both rural and urban locations" (p.110). These participate irregularly in meetings and in the day-to-day routine of their community. When they do, their urban interests and mentality take over and influence processes and decisions. Also in the Altiplano Norte the widespread phenomenon of "multi-locational households" (*residentes'* households)

shapes inevitably rural villages' life, including practices like agrobiodiversity conservation, which relies on a collective effort and a distribution of roles and responsibilities that responds to a shared custodianship at both the family and the community levels. As compared with *pobladores*, *residentes* often have a different attitude towards their community's issues. Their actions can generate approval, given their charismatic influence (6.4.3), but they can also give rise to conflicts.

In my fieldwork sites I observed that the allocation of collective tasks was sometimes made difficult by the fact that numerous households in the community were *residentes*. Firstly, as discussed in 5.3.2, *pobladores* reported that *residentes* often lacked a solid knowledge of the village's territory and agriculture. Secondly, they complained about *residentes* being frequently absent from community meetings and discussions. Thirdly, *residentes*' participation, besides being irregular, was often considered opportunistic. In both Coromata and Okola I heard farmers protest about *residentes* trying to steer collective decisions to their advantage (Fieldnotes 28-11-2012; 24-01-2013). Fourthly and relatedly, *pobladores* argued that when *residentes* were community authorities they shaped the list of priorities established at the community level at their convenience, by activating their networks across rural and urban areas to achieve resources and support. Some farmers believed that *residentes* in public roles were not as careful and committed as *pobladores* (Focus groups Cachilaya 26-09-2012; Coromata 03-12-2012). In Okola, in March 2013, I participated in a meeting in which community authorities discussed the implementation of a project for the creation of a water distribution system with the representatives of a foreign NGO supporting it. Months after disbursing the funds, the NGO representatives were surprised, to say the least, to see that the construction of the water tank and the pipeline they had financed had not yet started. Two thirds of the community authorities in Okola were *residentes*. The explanation that they gave for this deadlock was that conflicts had arisen within the community about the location of the tank and the procedures to follow in its construction. The pipeline, in fact, would benefit mainly an area - the driest in the village - where mostly ASITURSO members lived. It would have allowed them to access enough water to carry out their agricultural and tourism-related activities. However, the rest of the community, which would also be affected by construction works, considered this unfair and demanded that a tank was built also in their territory. Authorities - not living permanently in the community and busy as they were with their job and commitments in the city - after consulting with the municipality, had sat on the problem for months without pushing for a resolution (Fieldnotes 04-11-2012).

The conservation of agrobiodiversity as an objective to be pursued at the community level was seldom emphasised by traditional authorities while I was in the villages. Sometimes NGOs - agronomists told me - struggled to make them support the conservation initiatives that they launched. The following consideration - shared with me by one of my informants in PROINPA - is relevant. Authorities, especially when they were *residentes*, prioritised initiatives linked with the modernisation of the village, mostly through the improvement of infrastructure. They considered the conservation of agricultural diversity to belong to the private sphere - where individual families could take decisions concerning the agrobiodiversity they maintained as they saw fit. The promotion of on-farm conservation, therefore, was an aspect that they neither pushed for including in PDMs, nor brought up in community meetings (Unstructured interview 14-11-2012).

Nevertheless, with the intense activity of NGOs in the Altiplano a gradual change was in place. During my experience in rural communities associations implementing initiatives for the conservation of genetic resources on farm (i.e. APROCA, ADAMA and, in a different way, ASITURSO) were emerging as a stable presence in indigenous villages. In Cachilaya and Coromata meetings between scientists and traditional authorities were occasionally held to raise awareness on agrobiodiversity conservation's importance and the success of the agrobiodiversity-related activities performed with some inhabitants (as confirmed by PROINPA's Annual Report for IFAD NUS III 2012). In 2013 authorities gave recognition to the initiatives proposed by agronomists in the public speeches they held on the occasion of agrobiodiversity fairs and the *día de campo*, organised in Cachilaya. Scientists reported that they showed greater propensity than in the past to sponsor and financially support agrobiodiversity-related work, especially when this increased the community's visibility and brought economic gains. I was informed that some of the initiatives implemented in the municipality by PROINPA and CARE Bolivia would be included in the PDM of Batallas (Fieldnotes 11-09-2013). Flores et al. confirm this; in 2014 the municipality included agrobiodiversity conservation for climate change adaptation in its PDM for the first time (Flores et al. 2014).

6.4.5 Technical knowledge takes over

According to Velásquez-Milla et al. (2011), changes in "language, customs, food and use patterns of natural resources; migration and formal education" affect farmers' cultural identity and attachment to their community (p.18). As a consequence, the processes traditionally put in place for the conservation of agricultural diversity are altered. In line with these authors, in

this section I argue that the fact that people in the Altiplano Norte rely less on traditional knowledge and more on knowledge transmitted to them by scientists affects agrobiodiversity conservation.

Firstly, in rural villages smallholder producers reported that, due to climate change, the traditional environmental indicators that they had relied upon for centuries were no longer effective (5.3.2).

Secondly, farmers' knowledge about varieties had changed. One example: During interviews in the field farmers did not show to hold any knowledge about the use and distinct properties of quinoa varieties. They would call different varieties with names that in the Aymara language mainly referred to the grains' colour, an immediately visible characteristic. However, they could not distinguish them in any way after taking off their shell through washing. They said they had the same taste and they often mixed varieties together for consumption and sale. As a consequence, most farmers considered quinoa varieties as mutually replaceable (Semi-structured interview with Doña Patricia 27-09-2012; Unstructured interviews with Cachilaya farmers). Quinoa varieties indeed differed from one another in nutritional and agronomic properties (i.e. protein and starch content, resistance to frost or drought, etc.). Most farmers, however, did not seem to know this. Scientists - I was explained - were aware that this knowledge had been lost to a large extent. Therefore, they sought to transmit it to farmers through workshops and trainings. In fact it was a subject of teaching in universities (Participant observation and unstructured interview with PROINPA staff member 23-10-2012).

Thirdly, agronomists were perceived by farmers as important figures of reference. In Cachilaya and Coromata scientists' advice was not followed acritically by producers, who would take strategic decisions according to their experience and needs. However, scientists, especially when they had built a solid relationship with community members, were listened to and trusted. In particular, they were asked for advice about seed varieties' properties, fertilisers, pest control, sowing and harvesting procedures (Fieldnotes, participant observation 19-10-2012).

Youth, in particular, appeared as being more and more attracted by formal channels of learning. In the Agronomy Faculty of the university UMSA of La Paz it was common to see Aymara students walking in the corridors, including girls wearing their traditional clothes. In PROINPA there were Aymara staff members, including competent *cholitas* from the Altiplano, raised in El Alto and graduated from UMSA and UPEA. Also the agronomist in charge of the activities carried out in Cachilaya and Coromata was of Aymara ethnicity and came from a

village in the municipality of Huarina. Her expertise and skills, familiarity with the Altiplano culture and customes, and the fact that she spoke fluent Aymara made her a fundamental resource for this organisation's work. She explained to me that many students from rural areas considered opting for a subject that was directly applicable to their families' livelihoods a sensible choice. Besides, the achievement of a degree was for them an appealing perspective in general.

As a final reflection, the role of language must be also taken into consideration as a fundamental factor in the conservation of traditional knowledge. According to Skoufias et al., language shapes social networks among indigenous people, and makes them function. These authors' analysis refers to the indigenous peoples of Mexico and identifies the capacity to speak an indigenous language as decisive in the definition of relationships across a range of different sectors and activities, and in economic decisions, particularly in rural areas (Skoufias et al. 2009).

According to my analysis - based on the evidence presented previously - in the Altiplano Norte speaking Aymara was crucial to participate in traditional agrobiodiversity conservation practices in rural villages. It was essential to handle the indigenous nomenclature of varieties (5.3.1), to exchange knowledge (5.4.2), to participate in collective activities, and to make use of traditional channels of seed and skill transmission (5.4.1; 5.4.2). Since second generation migrants did not generally learn the Aymara language (6.3.3), I conclude that the only way in which they could interest themselves in agriculture and agrobiodiversity was through structured and official channels, like formal education. The question arises then whether - because of rural-urban migration - technical knowledge acquired through formal education is the only way in which agrobiodiversity-related notions will be transmitted in the future. This is a possible scenario. However, it is important to remember that on-farm agrobiodiversity conservation and the acquisition of relevant knowledge cannot be abstracted from the yearly practices of sowing and harvesting, transforming and selecting, which require a constant and continuous presence within agro-ecosystems and farmers' communities (5.4.1).

6.4.6 Farmers' simplifying choices in the framework of a *cholo-mestizo* mentality

To conclude this chapter I focus on the role that the *cholo-mestizo* inhabitants of La Paz and El Alto have - with their lifestyle and mentality - in deagrarianisation and agronomic simplification in the rural Altiplano Norte. Firstly, *cholo-mestizo* people are often *residentes* in rural communities. Secondly, the *cholo-mestizo* income-and-consumption-oriented mentality

influences aspirations and priorities in rural areas. Thirdly - even when indigenous people's appeal towards the urban does not translate into a decision to migrate - livelihood, mentality and lifestyle changes that respond to a *cholo-mestizo* logic occur in rural communities, in the framework of *in situ* urbanisation. I have already discussed these points. Therefore, in this section I only highlight two particular aspects - not yet analysed individually - that are strictly linked with the three of them. One is the increasingly crucial role of the market for Aymara farmers; the other is the transformation of food consumption habits in indigenous villages.

Access to the market is easy for Altiplano farmers today. Smallholders from Cachilaya, Coromata and Okola can reach quickly and cheaply not only rural markets (i.e. *feria de Batallas*, *feria de Achumani*, *feria de Kerani* etc.), but also bigger ones in La Paz and El Alto (4.4). The market, Pascual & Perrings 2007 argue, tends to penalise minor crop varieties in favour of mainstream high-yielding ones. This was often the case in the Altiplano Norte *ferias*, where I observed that high-yielding varieties were offered more than minor underutilised ones (Fieldnotes, participant observation 14-11-2012), exchanged mostly through traditional channels (5.4.1). Farmers valued "modern" seeds for their agronomic characteristics, as explained earlier in this chapter (6.4.5). As a consequence, the demand for such products was high. This affected farmers both when selling and when buying (below).

I argued in "*Seed acquisition through the market*" (5.4.1) that when farmers - due to crop failure or the desire to improve their production - turn to to the market to re-create or enrich their seed basis, they often end up buying "modern" high-yielding varieties. This happens because these are - in their view - a purchase worth their money.
I heard many times in both rural communities and urban areas that "*antes*" ("before") farmers relied exclusively on their agricultural production for surviving. In other words, they were subsistence farmers and their work and aspirations did not include much beyond their own sustenance and their children's. On the contrary, "*ahora*" ("now")/at the time of my fieldwork people in rural communities were interested not only in their survival, but also in earning money and buying commodities (4.2.3). This is a "story" that both farmers and scientists would remind me of from time to time in response to my questions (Fieldnotes, unstructured interviews with Cachilaya and Coromata farmers 09-2012; with PROINPA staff 14-08-2012; 23-10-2012).

When farmers wished to sell their products, they knew that they had better chances of selling some rather than others. In Cachilaya and Coromata smallholders sold cheese - because they

produced it in surplus, and they knew it was requested on the market - and grains, which had a high selling price (4.2.2). Sometimes they also sold *chuño* or *tunta*, on their own or through intermediaries, because urban buyers requested both products. Tuber seeds were seldom sold: firstly, because smallholders' production was normally not sufficient for both self-consumption and sale; and secondly, because a market for minor varieties did not exist, and barter or gifts were more common channels for the acquisition of small amounts of underutilised seed varieties (Survey data and relevant conversations with Cachilaya and Coromata respondents).
The urban market scenario included shops and stalls that were well-established and relied, therefore, on pre-set provision networks. In the *feria 16 de julio* of El Alto there were c*holo-mestizo* vendors - mostly women - who showcased different tuber and grain varieties in big sacks for their urban and rural buyers. These vendors had rural origin and told me they obtained the seeds they sold from their relatives and acquaintances from their native community (Fieldnotes, unstructured interviews with women vendors in El Alto 14-11-2012). Becoming part of these networks, I understood, was possible only if farmers could count on efficient intermediaries or well-connected urban acquaintances. Otherwise it was too demanding for individual families to fulfil the obligations connected with this business (i.e. producing a sufficient surplus, bearing the transportation costs). Farmers who regularly provided seeds to vendors had an important extra source of income. However, every year they had to work for harvesting an amount of produce that allowed them to sell a portion of it. It derives that a pull towards the production of marketable varieties was there in supplying farms.

In urban markets it was extremely rare to find minor neglected and underutilised seed varieties. In El Alto it was possible to get some of *papa*, oca and papalisa, alongside mainstream ones, because - as vendors explained to me - at times *cholo-mestizos* enjoyed consuming them for taste reasons. These could be used as seeds at the time of sowing, and *pobladores* and *residentes*, who patronised both street stalls and shops, bought them. Nevertheless, finding non-mainstream varieties in urban fairs was not the norm. They were sold in small quantities and sometimes they were available only upon request. Buyers, in fact, considered it to be an exceptional event. When I went to the *feria de El Alto* with some urban migrants from Huarina, they defined themselves as "lucky" for having found a particular *papa* variety they were looking for (Fieldnotes from the *feria de El Alto* 15-11-2012).
In conclusion, the market required a relatively narrow range of varieties, as compared with the diversity that was conserved in rural communities. The vendors' selling attempts with potential customers always emphasised the availability of certified seeds and high-yielding varieties (Fieldnotes, participant observation in urban markets 21-11-2012).

Because of the penetration of the market, consumption habits were changing in rural communities. As farmers confirmed, native tubers and grains used to be the only staples of the Andean diet. However, in 2012/2013, Aymara peasants, particularly youth, largely consumed pasta and rice. "*Los jóvenes no quieren comer sopa de quinua, no les gusta, quieren comer fideo. Yo sigo comiendo quinua, no como fideo, pero sí como mucho arroz*" ("Young people don't want to eat quinoa soup, they don't like it, they want to eat pasta. I still eat quinoa, I don't eat pasta, but I do eat a lot of rice" – Semi-structured interview with an elderly farmer in Cachilaya 20-02-2013).

Furthermore, farmers said that it used to be impossible to find fizzy drinks or snacks in the Altiplano. These drinks were largely consumed (although mostly as treats in special occasions) in rural communities. Farmers bought them not only in the villages' little shops (for example there was one in Cachilaya and one in Kerani, the neighbouring village of Coromata), but also in urban *ferias* that farmers visited regularly. Buying these products was relatively easy and affordable.

Every Saturday morning villages got empty, while farmers went to the market to buy the vegetables that they did not grow but consistently used (i.e. tomatoes, onions, carrots etc.), as well as bread, pasta and rice. During my fieldwork I observed that these grains/grain products, although not produced locally, were fully integrated in the rural diet, and in numerous families they replaced the Andean grains quinoa and cañahua, often sold due to their high price.

As tables 6.3 and 6.4 show, although native products like *papa*, *chuño* and *tunta* were consumed frequently by Aymara people - with *papa* being their absolute staple - the diet of indigenous farmers relied greatly on white bread, vegetables, rice and pasta, bought in the market. A regular consumption of these products inevitably required the availability, on a weekly basis, of cash money.

Farmers valued these products greatly, to the point that in their eyes they were to be preferred to native tubers and grains. In the "Andescrop" survey, people from Cachilaya and Coromata were asked which of the products included in a list were, in their opinion, nutritious. A phrasing that could be easily understood by farmers ("which are the foods that when eaten give you energy and strength and are good for your body and for your health?") was chosen by the interviewers, in the attempt to make the concept of "nutritious" comprehensible for their interlocutors. The same foods included in the tables 6.3 and 6.4 featured in the list. Although *papa*, the Andean staple par excellence, was ranked first in most cases, the majority of farmers attributed a higher nutritional value to tomatoes, carrots, rice, and pasta, than to quinoa and

cañahua, which are, in truth, extremely nutritious grains. Although one could doubt the effectiveness of the question and the objectivity of responses, due to the scarce familiarity of Aymara farmers with the concept of "nutritious", the results of this survey indicated, anyway, that many farmers attributed an important value to products that they did not produce, but consumed thanks to the market.

Tables 6.3 and **6.4:** Consumption frequency of a list of products in Coromata (6.3) and Cachilaya (6.4)

Raking	Product	Consumption frequency (times per week)
1	Papa	6.9
2	Chuño	6.7
3	Onion	6.6
4	Carrot	6.4
5	Tunta	5.5
6	Broad bean	5.3
7	Tomato	5.2
8	White bread	5
9	Rice	4.2
10	Green pea	3.5
11	Cañahua	3.2
12	Pasta	3
13	Quinoa	2.7
14	Lettuce	2.6
15	Oats	2.5
16	Oca	2
17	Barley	1.9
18	Papalisa	1.6
19	Biscuits	1.5
20	Caya	0

Raking	Product	Consumption frequency (times per week)
1	Papa	6.6
2	Onion	6
3	Green pea	6
4	Carrot	5.5
5	Tomato	4.7
6	White bread	4.3
7	Broad bean	3.7
8	Chuño	3
9	Oca	2.9
10	Tunta	2.7
11	Papalisa	2.4
12	Quinoa	2.3
13	Rice	2.1
14	Barley	1.9
15	Pasta	1.7
16	Caya	1.7
17	Lettuce	1.3
18	Oats	0.5
19	Biscuits	0.4
20	Cañahua	0

Own elaboration of the data from the "Andescrop" survey.
Note: The tables reflect the specificities of the agro-ecosystem of each village. While, for example, oca was produced and consumed very little in Coromata, and *caya*, freeze-dried oca was not consumed at all, cañahua was not sown in Cachilaya and was completely absent from the farmers' diet in this village.

Based on the evidence presented in this section, I argue that - although meat is still very rarely eaten in rural villages - the consumption habits of Aymara farmers are becoming more similar to those of the *cholo-mestizo* inhabitants of La Paz and El Alto. On one hand, new priorities and an intense mobility of people within the Altiplano *desakota* region allow the market - central in the *cholo-mestizo* society - to acquire more weight in the routine and the choices of rural people; on the other hand, *cholo-mestizo* preferences alter eating habits in rural areas.

Agronomic simplification takes place in Aymara communities as the market privileges a limited number of agricultural varieties to the detriment of diversity, and locally grown crops lose prominence in daily meals with the affirmation of foods that are available in fairs, and are either imported from other regions, or industrially produced.

With their lifestyle and mentality *cholo-mestizo* people - the protagonists of the social and economic transformation underway in the Altiplano Norte - do not reject agriculture and agrobiodiversity conservation. On the contrary, they embrace a rhetoric that celebrates rural life and native crops (5.7.1). In practice, however, economic gains and social recognition are not generated by agriculture on its own, but rather by activities - often carried out across rural and urban areas - that produce wealth, abundance, and prestige - the social and material conditions that are valued and pursued in the *cholo-mestizo* society. As a result, given the influence of the *cholo-mestizo* model on rural people, and the appeal that an urban lifestyle has on Aymara farmers, simplifying choices are made by both *residentes* and *pobladores* in rural communities, whenever the conservation of a broad diversity is not considered compatible with its founding principles.

7. The reinvention of agrobiodiversity through "indigenous modernities"

7.1 Introduction

In this chapter I discuss, firstly, the ways in which farmers' consideration and use of agrobiodiversity change in a context of *in situ* urbanisation and livelihood diversification. In particular, I highlight the role of temporary migrants; the consequences of social remittances; the influence of migrants' networks and farmers' mobility on production and consumption habits. I focus on the incorporation of agrobiodiversity fairs in some indigenous communities' routine as an example of "indigenous modernities" formation.

Secondly, I analyse the causes and consequences of return migration, by discussing the case of Okola, where community agro-tourism is practiced. This case is defined by scientists a "best practice", as currently it is the only one of its kind in the Altiplano Norte. Here agrobiodiversity - traditionally relied upon exclusively for subsistence reasons - is conferred new uses and values in the framework of agro-tourism.

Finally, I explain how the current institutional and socio-economic framework contributes to the reinvention of agrobiodiversity in the Altiplano Norte. On one side, urban elites - within a gastronomic boom that revives rural ingredients and recipes - increasingly value Andean crops and dishes; on the other side, the *cholo-mestizo* inhabitants of La Paz and El Alto contribute to a "ruralisation" of preferences in urban areas and have the potential of becoming the future main consumers of rural foods.

This chapter presents the data I collected both in the three rural sites and in La Paz and El Alto. In particular, the information I include is the result of participant observation (especially in moments in which farmers interacted with scientists and urban stakeholders - i.e. farmers' negotiations with potential buyers and gastronomic events like the *Feria Tambo*); interviews; the "Andescrop" survey; and archival research in NGOs and Bolivian universities (through this method I obtained PROINPA's project reports and the the "*Recetario - Nuevos Preparados a base de Quinua y Cañahua*" - Alarcon et al. 2011). The analysis is based on both evidence collected during fieldwork and literature sources discussing agrobiodiversity conservation incentivising measures (i.e. Sthapit et al. 2006; Gruberg et al. 2013; Taranto & Padulosi 2009), repeasantization (Van Der Ploeg 2008) and "indigenous modernities" (Robins 2003).

7.2 *In situ* urbanisation: a favourable framework for agrobiodiversity reinvention

According to Van Der Ploeg (2008), indigenous communities, although pressured to surrender to a relentless depopulation and agricultural "deactivation", enter into a dialogue with these forces, by adapting to the transformations occurring in the broader *desakota* region. Agrobiodiversity conservation is also challenged. In this section I show how, in spite of this, new stimuli, emerging from farmers' responses in the face of structural changes, promote the preservation and the recovery of agricultural varieties and of relevant knowledge and practices.

In 5.4.1 I explained that agrobiodiversity conservation occurs in Altiplano Norte farms thanks to a series of traditional and non-traditional seed and knowledge exchange and acquisition practices. Furthermore, I clarified that the continuation and the revival of agrobiodiversity conservation respond to different interests and needs, some of which have been embedded in local food and agricultural systems for centuries, whereas others are more recent and have emerged in a "new rurality" framework. Based on these elements, I now retrace the main features of agrobiodiversity reinvention in indigenous farmers' communities, and discuss how they come into play when "indigenous modernities" take shape.

7.2.1 Temporary migrants, enthusiastic interlocutors for scientists and charismatic leaders

Van Dusen - in his paper on maize diversity in Mexico - argues that the consequences of migration on agriculture and farmers' choices vary according to the nature of migration (Van Dusen 2005). In chapter 6 I showed that in the Altiplano Norte permanent migration tends to affect agrobiodiversity conservation negatively. Temporary migration, however, has different outcomes, as I will now illustrate.

Firstly, in rural communities the people who - during my fieldwork - stood out for collaborating most constantly and enthusiastically with scientists, and who engaged most actively in agrobiodiversity-related initiatives, had been migrants at some point in their life. Some examples from Coromata: Don Mario was a shoemaker in El Alto before retiring and returning to the countryside; Don Fernando and Don Carlos, who lived permanently in the community due to family reasons and responsibilities connected with representation roles, used to travel to La Paz and El Alto to work there for short periods as carpenters or construction workers;

Don Juan worked seasonally in Los Yungas in the harvest of coffee and fruit (Unstructured interviews 09-2012). In Cachilaya the only woman who was nominated a "custodian" of agrobiodiversity in 2012 (see below), Doña Patricia, worked as a cleaning lady in the town of Batallas, besides being a farmer (Interview 27-09-2012). She was one of the main points of reference in the village for urban-based organisations.

I will use the example of Don Juan to illustrate the attitude of temporary migrants towards urban-based actors and exogenous opportunities, available to farmers following their participation in the initiatives that scientists sponsor. The consequences of return migration, instead, are discussed in section 7.3.

Don Juan was one of the most prominent characters in the association ADAMA. He was a constant presence in meetings and group activities. Every year - he explained to me - he would leave his village in the dry season, when the agricultural work in the Lake Titicaca region was on hold, and travel to Los Yungas, where he worked during the tropical harvest season.

Juan was one of the people who stepped forward the most to discuss and negotiate with scientists. He was curious and eager to learn from them. On several occasions I noticed his interest in trying in his fields the new seed varieties that agronomists offered to ADAMA members (Fieldnotes 18-10-2012), as well as in acquiring new techniques (i.e. concerning the preparation of compost, or the spraying of fertisol, a natural fertiliser). He was one of the few farmers who, during the workshops held by scientists, would ask clarification questions and take notes.

As a result of this, Juan had gained the trust of scientists and community members for being proactive and capable of representing ADAMA in official meetings with donors, or in front of potential buyers for the association's products.

This is an excerpt from my fieldnotes from the "*Feria Tambo*":

"*Don Juan speaks both Aymara and Spanish. […] Scientists call him all the time to explain the work of ADAMA to the visitors of the association's stand. He acts with the usual modesty and shyness that characterise the way in which rural indigenous people interact with urban elite Bolivians or foreigners outside their geographical comfort zone - their rural community, El Alto or certain areas of La Paz. However, Juan is capable of providing accurate information concerning the products and the traditional foods that the representatives of ADAMA are displaying. Some Italian friends of mine come to the association's stand. Juan is asked to step forward to give them some explanations and encourage them to buy something. While he speaks with them, he seems shy. He keeps his hands behind his back and looks at his feet. But*

he manages to respond to all of their questions, he illustrates the work of ADAMA and describes the products they have. He also introduces the other farmers to the visitors. At the end, my friends leave with a few packets of humintas de quinua *and some cañahua cake slices*" (12-10-2012).

Juan was an important support to the activities of agronomists in Coromata. Because his household relied on multiple livelihoods and sources of income, he could count on a relative abundance of resources as compared to other farmers. On two occasions, in the crop year 2012-2013, his family was able to put some land to ADAMA's disposal. Plots were collectively rented to set up one multiplication plot and one demonstration plot. Here, under the supervision of scientists, different quinoa and cañahua varieties were sown for farmers to test the performance of each. Being a temporary migrant significantly contributed to his propensity to run the risk of investing time and resources in new activities and experiences concerning agrobiodiversity conservation.

The case of Don Juan is representative of those of other temporary migrants I interacted with in rural villages. Thanks to their migration experience, these people were overall more self-confident and open to the world outside their village than non-migrant farmers. At the same time, as compared to permanent migrants, they would leave for shorter periods of time, so their participation in agriculture and community life throughout the year was more consistent. In addition, unlike *residentes*, they relied on agriculture as their main livelihood and used their capacities to increase their wellbeing through an improvement of their agricultural production and diet. While engaging in agricultural or non-agricultural activities away from their village (i.e. with a seasonal employment or with occasional jobs in the city), they were often at the forefront in the new initiatives proposed by external actors.

It is striking to notice how several of the distinctive features of "custodian farmers" overlapped in the Altiplano Norte communities with those that temporary migrants also showed.
According to Sthapit, a "custodian farmer" is a farmer who maintains, adapts and promotes agrobiodiversity (Sthapit et al. 2013). The role of these actors is considered crucial in the conservation of diversity on farm. Therefore, organisations like Bioversity International - coordinating the project IFAD NUS III in three countries[82] - have worked to strengthen and improve through scientific backing the effectiveness of their work (PROINPA's Annual Report

[82] Bolivia, Nepal and India.

for IFAD NUS III 2012; Gruberg et al. 2013). The figure of "custodian farmer" was formalised in the communities involved in this project, and "custodian farmers" were nominated. In Bolivia the purpose of identifying them was also to create an official link between *in situ*/on-farm conservation and *ex situ* conservation within the national system *Sistema Nacional de Recursos Genéticos* - SNRG (5.2).

In the framework of the project IFAD NUS III, a group of "custodian farmers" was formed in both Cachilaya and Coromata from the people who consistently worked with scientists and belonged to the organisations APROCA and ADAMA. In practice the choice of "custodian farmers" occurred in indigenous communities according to specific elements. These are illustrated by Gruberg et al. 2013 with reference to Cachilaya: 1) the knowledge about crop uses; 2) the willingness to share planting material and knowledge within the community; 3) the desire and the propensity to constantly experiment with crop diversity; 4) an interest in participating in on-farm conservation efforts; 5) strong leadership qualities; 6) an engagement with people within and outside rural communities that generates access to new information and materials; 7) the willingness to engage with research for development organisations (Gruberg et al. 2013). All of these elements but the first can be considered as characteristics that distinguish temporary migrants. Organisations promoting and coordinating initiatives for agrobiodiversity conservation valued greatly the possibility of relying on people who, thanks to their personal and experiential traits, could be for them key informants in the preparation of studies, and first points of contact when new activities were proposed and tested, and who motivated other farmers to participate in collective conservation actions. Five out of the ten "custodian farmers" nominated between Cachilaya and Coromata were current or former temporary migrants. These five were the most active in the group of "custodians"and a driving force in both communities.

Concerning the first element that Gruberg et al. identify - the conservation of knowledge about crop uses - I should clarify that this was not distinctive of temporary migrants, but, according to my observations, not even necessarily of "custodian farmers". The knowledge held by these people did not, in fact, exceed the knowledge held by other community members neither in Cachilaya nor in Coromata, as all farmers, with just a few exceptions, appeared to be on the same level in this respect (5.4.2). As Gruberg et al. also acknowledge, in the actual nomination of "custodian farmers" "the 'true' knowledge holders" were not always chosen, because they were not constant participants in the workshops and meetings organised by scientists, "due to their shyness, poor communication skills, or busy schedule" (Gruberg et al. 2013, p.21).

Picture 7.1: "Custodian farmers" of Coromata and Cachilaya visit the *Estación Experimental Toralapa* with a trip organised by PROINPA - while Juan from Coromata takes notes (on the left), Patricia from Cachilaya observes with interest some *papa* seed varieties (on the right)

Toralapa, 25-04-2013.

In a "new rurality" scenario, although the conservation of agrobiodiversity-related knowledge remains crucial to ensure a sustainable continuation of relevant activities, other characteristics take over and trigger a process of agrobiodiversity reinvention. "Custodian farmers"/temporary migrants are successful charismatic figures that farmers within rural communities refer to and follow. As the next section clarifies, the choices of these characters often shape the strategies put in place by their own family, as well as the attitude of other community members towards agrobiodiversity and the activity of scientists in their village. Their function, in other words, is crucial for the propagation of the efforts of scientists, inevitably focused on a restricted number of families in each rural community.

Further explanations about the tasks embedded in the role of "custodian farmer" and the reception of this concept in Aymara villages are discussed in section 7.2.3 with the aim of highlighting the selectivity with which indigenous people relate to externally introduced "modernities".

7.2.2 The openness of indigenous farmers by effect of social remittances and *in situ* urbanisation

As mentioned in 4.2.2, remittances in the Altiplano Norte rarely take the form of monetary flows, especially in the framework of internal rural-urban migration[83]. In addition, monetary remittances - whether arriving from Bolivian destination areas or from migrants abroad - are seldom employed in agricultural improvement in Altiplano communities, as the PDM of Huarina (2012) confirms. According to Balderrama Mariscal et al. (2011), it is common that they are used for "non-productive consumption" - i.e. the purchase of commodities - or - as De la Torre Ávila (2009) argues - for covering health and education expenses. In chapter 4 I illustrated this extensively.

In this section I will show that rather than monetary remittances, it is social remittances that play an important role in agriculture in general and in the process of agrobiodiversity-related practices' transformation in particular. Social remittances are "the ideas, behaviors, identities, and social capital that flow from receiving to sending […] communities" (Levitt 1998, p.927), as well as an important "conceptual tool for analysing local-level cultural diffusion" (p.943). If, on one hand, speaking about social remittances is not completely relevant in a *desakota* context in which - due to *in situ* urbanisation - the distinction between countryside and city is increasingly blurred, on the other hand doing so is useful, because the concept of social remittances embeds a selectivity component. According to Levitt, "senders adopt certain new ideas and practices while filtering out others, and receivers adopt particular elements while ignoring others" (p.943-944).

Social remittances are just one of the elements composing the *in situ* urbanisation picture and their role fades out in a *desakota* situation in which rural-urban boundaries are not defined and multi-directional exchanges are continuous. However, this concept helps to trace the formation of "indigenous modernities". Indeed, just like externally introduced initiatives, social remittances undergo a process of selection and integration (Robins 2003) that takes into account not only tradition but also the new identities emerging in the Altiplano Norte.

In Aymara communities non-migrant farmers perceived migrants as important figures of reference, experimenters, and innovators (5.4.1, 6.4.3, 6.4.4 and 7.2.1). Their enthusiasm and proactivity were contagious. In Coromata and Cachilaya charismatic farmers/temporary migrants often played the role of models and leaders within their villages, shaping the

[83] This is confirmed by Andersen (2002).

relationship between smallholders and scientists, active on their territory. For example, they had convinced other farmers to get involved in the initiatives proposed by agronomists. They persuaded family members and neighbours to do so by informing them about the advantages of participating in such activities. Lidia, Patricia's niece, joined APROCA in January 2013 because her aunt had explained to her that, through this association and its collaboration with NGOs, farmers could learn new things - agricultural techniques for preparing fertilisers and for getting rid of pests in their fields, or new recipes with native ingredients; obtain seeds; become aware of selling opportunities bringing them economic gains; get involved, if they managed to grasp relevant opportunities, in workshops, *ferias*, and field trips (Interviews 23/25-01-2013). Furthermore, they inspired others through their own experience and the benefits they enjoyed. In Coromata, the family of Don Carlos and Doña Elizabeth had repeatedly obtained from scientists new seeds that they tested in their fields. In addition, farmers participating in the sowing of "diversity blocks" [84] - i.e. Community Seed Bank, collective multiplication or demonstration plots - would get to keep part of the harvest, after selecting the seeds for the following sowing. This happened with the permission and the support of scientists, and with the purpose of promoting further multiplication in families' fields and a gradual increase in the sense of ownership of new seeds (Fieldnotes 09-2012). The families of ASITURSO provide another meaningful example. In Okola these families significantly increased their revenues and improved their living conditions thanks to their participation in community agro-tourism. Almost all founding members of this association were return migrants, and their migration experience in La Paz and El Alto had contributed greatly to their involvement in this project, as I will further discuss in 7.3. ASITURSO had expanded significantly in the 6 years between 2006 and 2012, going from 6 to 20 families.

Social remittances must not be considered in isolation, and as the only factor affecting non-migrant farmers in indigenous communities. People's mobility, and rural-urban networks also come into play within the picture of *in situ* urbanisation. The specific behaviours emerging in rural communities by effect of social remittances and, overall, *desakota* dynamics, were the eagerness to acquire new knowledge that migrants propagated in their communities of origin; the entrepreneurial mentality taking shape following the diversification of livelihoods and the proximity of the city; the openness towards external actors. In particular, the open-mindedness and the curiosity of certain individuals and their role as leaders within their villages made scientists' work more viable and successful. The recovery and (re)introduction of

[84] "Diversity blocks" is a definition from Sthapit et al. 2006, GP7.

seeds, and the diversification of crop varieties' uses would not have raised the same interest if farmers' communities had not been going through such a process of transformation.

7.2.3 A natural propensity for market participation: seed acquisition and products' sale through rural-urban connections

"By concentrating on directly affected economic actors, we may be looking for the impacts of […] change in the wrong places" (Taylor & Dyer 2006).
In line with Taylor and Dyer's choice for a broad scope in studying the impact of migration, in this research I do not keep a restricted focus on migrants but seek to grasp the consequences of migration beyond those individuals and households directly involved in it.
In a context of *in situ* urbanisation and livelihood diversification market participation is increasingly valued by indigenous farmers, due to the availability of revenue-generating selling opportunities within the Altiplano *desakota* region. On one hand, migrants' networks and rural-urban mobility play an important role in creating new channels of seed and knowledge acquisition (5.4). On the other hand, social remittances and, overall, transformations connected with *in situ* urbanisation are responsible for a shift to an entrepreneurial mode of farming (Van Der Ploeg 2008). In 6.4.6 I showed how market forces often contributed to agronomic simplification because of a pull towards product uniformity based on demand. However, in 5.5.6 I also argued that an entrepreneurial mentality is not incompatible with agrobiodiversity conservation. In this section I will draw attention to some positive mechanisms concerning farmers' market participation that lead to agrobiodiversity reinvention.

Firstly, during my fieldwork I noticed that farmers were particularly willing to accept new commercial partnerships or occasional selling opportunities. They could easily become aware of these through rural-urban connections, migrant networks and NGOs and scientists. In Cachilaya and Coromata - according to the survey conducted with farmers - people got information about the price of the goods they intended to sell, the selling venues and the market demand for their products from - in order of importance - intermediaries or retailers, the radio, community members living in the community, community members living in the city, and scientists. Besides selling goods individually, the creation of producers' associations like APROCA and ADAMA also allowed smallholders to collectively become the suppliers of medium-size urban companies or restaurants. This had already happened in several cases for the farmers of these communities before 2012/2013 - for example with "Alexander Coffee" (5.5.6) and the companies "Bolivia Natural" and ABVINAP ("*Asociación Boliviana de Villas*

Naturistas y Áreas Protegidas") for quinoa and cañahua (Informe SINARGEAA 2009). In 2012 APROCA and ADAMA members established a business partnership with a restaurant in El Alto for supplying quinoa, cañahua, *pitu* and *kispiña* (Fieldnotes 13-10-2012). Scientists outlined this opportunity to farmers, increasing their awareness of the economic value that what they normally produced for their own subsistence had on the market in the framework of such partnerships[85].

Secondly, farmers' collaboration with scientists also raised their awareness about other uses for agricultural varieties besides traditional ones. PROINPA - since the early 2000s - had carried out a series of cooking workshops to incentivise a diversification of agrobiodiversity's uses. In rural communities I participated in cooking workshops in which NGOs' staff taught farmers how to use native ingredients for the preparation of new dishes, suitable for their own consumption, as well as for the market (particularly for the tourists in the case of Okola). The ultimate objective of these workshops was to enable farmers to offer non-traditional (yet prepared with traditional ingredients) foods to tourists (in Okola) or other buyers, and participate in agrobiodiversity fairs and nationwide gastronomic events such as the *ferias* "*Tambo*" or "*Bio-Bolivia*". Recipes used local products as the main ingredients (mostly *papa*, quinoa and cañahua) and included just a few other ones that farmers had to purchase (i.e. sugar, lard, honey, white flour). While many people from Cachilaya, Coromata and Okola had gained an ability to easily prepare these foods, I noticed that they normally cooked them exclusively for sale and showcasing, rather than for private consumption. As 7.3.1 further shows, these new dishes and snacks, most of the time, were not integrated in the farmers' diets - not so much because of an incompatibility with their eating preferences and tastes, but rather because of the exceptional nature that farmers ascribed to them. While cooking with farmers in preparation of events like the *día de campo,* I could see that these foods all involved unusual preparation procedures (i.e. deep-frying, steaming, or baking - the latter impossible for most farmers if not upon payment in privately owned ovens in rural towns - instead of boiling or stewing[86], more commonly used in rural cooking). Furthermore, they were associated with special circumstances, and situations in which farmers wanted to impress

[85] PROINPA, through the project IFAD NUS, implemented an approach partially based on the use of PACS (Payment for Agrobiodiversity Conservation Services), an instrument providing farmers with market-based incentives for their conservation activity. Rather than direct reward mechanisms, market chain development was, in practice, the preferred strategy of reference. The feasibility of PACS is still being tested in Bolivia (Narloch et al. 2009; Pascual et al. 2011; Padulosi et al. 2011).

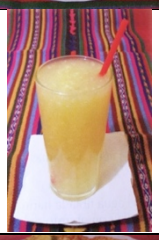
[86] Potatoes and other tubers, as well as broad beans and quinoa were normally boiled. Tubers were also consumed as *chuño* or *tunta*, and grains eaten in the form of *pitu*, which was not cooked unless *kispiña* (steamed buns) was prepared. Pot cooking was used for stewing or the preparation of soups.

visitors or gain prizes (like agrobiodiverisity fairs or gastronomic events, or the official visits from donors and development/conservation projects' coordinators - Fieldnotes 01-02-2013). By observing the daily routine of farmers' lives, it was clear that they had not yet penetrated the private space of their homes and the practice of family cooking.

Table 7.1: Some of the products that farmers learnt to prepare in PROINPA's use diversification workshops for quinoa and cañahua

	Quinoa cake
	Cañahua cake
	Quinoa bread
	Cañahua bread
	Quinoa *tawas*[87]
	Cañahua *tawas*
	Quinoa doughnuts

[87] Sweet fritters.

	Cañahua doughnuts
	Cañahua pancakes
	Quinoa *humintas*[88]
	Quinoa juice with apple
	Quinoa and vegetable *tortillas*
	Quinoa *aji*[89]

"*Recetario - Nuevos Preparados a base de Quinua y Cañahua*" (Alarcon et al. 2011).

Thirdly, farmers' awareness of the value of agrobiodiversity and the consideration that different stakeholders (i.e. scientists, chefs, tourists, organic shops) had for it largely depended on their involvement in the initiatives proposed by research for development organisations. In October 2012 the farmers of APROCA and ADAMA participated for the first time in the "*Feria Tambo*". They managed - through their presence and the sale of the food they had prepared - to not only obtain economic gains, but also observe that, to their surprise, urban buyers were interested in rural products. During the three days of the fair I could see a transformation of farmers' attitude - towards not only the visitors of their stall, but also their own products - occurring under my eyes. At the beginning farmers would treat the people who approached

[88] Bolivian cornbread - made of quinoa in this case - wrapped in corn leaves.
[89] Stewed quinoa with vegetables and pulses.

their stalls as simple customers, and with the same attitude that is typical of street vendors in La Paz and El Alto. They would sit, waiting for visitors to get close; then they would expect people to show interest in one or more of their products; they would give information about prices; finally, they would offer a discount if customers did not conclude their purchase straight away. While this attitude, common to *cholo-mestizo* sellers, generally works in street or market stalls, where most visitors go with the purpose of buying, it was not effective in a gastronomic fair like "*Feria Tambo*", where visitors were pushed by interest and curiosity, and by the desire to make a pleasant and instructive experience. Most of them were upper and middle-class Bolivians, or foreign tourists. Stalls had been located across the *Parque Urbano Central* according to the geographical origin of the products that were showcased and sold. Seminars and talks were held in a conference hall situated in the same space (Fieldnotes 14-10-2012). In section 7.4 I will explain the rationale behind the organisation and the success of such events. Here, instead, I wish to emphasise how some of the farmer participants from APROCA and ADAMA gradually understood the intentions with which people were approaching their stalls. They gained confidence thanks to continuous manifestations of enthusiasm and interest. They learnt how to satisfy the visitors' curiosity, by providing explanations about the origin of their products; the procedures implemented for crop transformation and for the preparation of food; their lifestyle and traditions. They also understood that, in order to make people purchase the food they were selling - new to urban and sometimes also to rural dwellers (see table 7.1) - they needed to offer free samples so that potential buyers could taste it. Needless to say, the individual skills of some particular farmers were crucial for the accomplishment of this change. These people were those who more than others were used to having contacts with the city, urban buyers and trade in general. They were: the current and former temporary migrants, who were present amongst APROCA and ADAMA members; a woman who often spent long periods in El Alto where her daughter lived; the owner of the only shop of Cachilaya. Their perspicacity and promptness made them see, through their experience of a gastronomic fair, an opening for themselves and their products in a new market. Pushed by the fact that they sold all the products they had brought, several farmers asked whether "*Feria Tambo*" would be held again on the following year, and expressed the desire to learn more recipes for the preparation of dishes and snacks with indigenous ingredients (Fieldnotes 11/14-10-2012).

7.2.4 "Indigenous modernities" in a *desakota* space: farmers' responses to two different initiatives introduced by scientists

"Indigenous modernities" take shape in the Altiplano Norte *desakota* region as part of a dialogue between the rural and the urban, the local and the exogenous. By applying a *cholo-mestizo* mentality - an "indigenous modernity" in itself - Aymara farmers react to externally introduced novelties in different ways. As Robins argues with reference to his case studies from South Africa, the responses of beneficiaries to development projects can include "cultural revitalization, overt and covert expressions of resistance, evasion, feigned compliance, circumvention, foot dragging, compromise, accommodation, selective appropriation and embrace of the signs, commodities and practices of consumer capitalism and the modern state, as well as voluntary and enthusiastic participation in development projects" (Robins 2003, p.283).

In this section I discuss the responses of Aymara farmers to two different initiatives introduced and supported by scientists over the last ten years, in the framework of an international research and development project - agrobiodiversity fairs and the nomination of "custodian farmers". Reactions have been different - enthusiastic in the first case, and rather cold in the second. I explain this difference by looking at the extent to which each one of them fits into the *in situ* urbanisation process, characterised by a pull towards a *cholo-mestizo* lifestyle. This provides evidence for farmers' strategic and selective relationship with the challenges and opportunities brought by external stakeholders. In fact, indigenous people incorporate some exogenous concepts and practices, while they reject others.

Agrobiodiversity fairs, launched by scientists in 2006, were held yearly in the Altiplano Norte communities involved in the project IFAD NUS. They encountered indigenous people's approval and, in spite of their implementation being heavily dependent on the support of external stakeholders, farmers participated enthusaistically. In chapter 5 I illustrated extensively the features and the structure of agrobiodiversity fairs, as well as their importance as a platform for seed and knowledge exchange. Here I focus on what has made these events successful in the "new rurality" scenario.

It is useful to highlight some specific aspects concerning their implementation:

1. Agrobiodiversity fairs are festive events that farmers enjoy taking part in (5.5.5). Furthermore, they are widely inclusive. They are open gatherings in which all community members participate. In the *ferias* I attended farmers from the host

community, as well as those from other villages (invited through NGOs), showcased agricultural varieties, foods and handicrafts. Special guests were there, as well as school children and the press. A scientist and an institutional representative held a speech at the beginning. This conferred agrobiodiversity fairs an official character, which encouraged farmers to take pride in participating and performing well (Fieldnotes from agrobiodiversity fairs - Rosapata, municipality San Andrés de Machaca 30-08-2012; Coromata 05-09-2013).

2. The preparation of agrobiodiversity fairs relies on the principles of reciprocity, resource sharing, and collective property (5.4.1). As I could observe before and during the three agrobiodiversity fairs in which I participated, when farmers pulled together the range of seed varieties to showcase, they supported each other, by virtue of the shared custodianship characterising their conservation work. Firstly, each family activated their own networks and acquired seed varieties by using traditional, as well as non-traditional channels. Secondly, people from different households often got together for cooking. Women exchanged recipes and merged their skills and resources for obtaining the best result possible. Thirdly, in advance of the fair, farmers collaborated for the preparation of the space where the fair would be held, with the physical and financial support of scientists, of some community members who were not directly involved in the activities these promote, and of local authorities (a novelty, I was told by farmers and scientists).
3. Agrobiodiversity fairs are not proper competitions. There were winners for each category, but, although the jury ranked participants according to their performance, rankings were not made public and there were no losers. The first farmers of each category were given bigger prizes, but all participants received a gift that compensated them for their commitment and time. This made farmers feel at ease and encouraged them to participate. As compared to the "rules" outlined in Sthapit et al. with reference to agrobiodiversity fairs in Nepal (Sthapit et al. 2006), the Altiplano Norte fairs put little emphasis on the competitive side of these events, given the importance of the collective dimension vis-à-vis the individual dimension in Aymara communities. What was valued and celebrated was the fact that fairs would take place thanks to the joint effort of many. The best performing farmers, nevertheless, were acclaimed and given open recognition.
4. The presence of urban-based stakeholders, particularly of potential buyers, increases farmers' interest in agrobiodiversity fairs. These events do not have the sale of products as their primary objective. On the contrary, they are conceived as settings in

> which diversity is only showcased by the farmers who conserve it. In the three *ferias* I attended, those who prepared and exhibited food did sell it at the end of the fair, after the winners were announced. However, participants also had the possibility of gaining access to new business opportunities. In Cachilaya and Coromata, at the end of the fair, representatives of APROCA and ADAMA established contacts with - respectively - the representatives of a private company and some chefs - possible commercial partners and future buyers for their products. Afterwards, they were particularly appreciative of these encounters. Local authorities were also satisfied, as they believed that these events made their communities gain visibility within the municipalities and - thanks to the press - the entire region (Fieldnotes 05-09-2013).

As the points above - particularly the third - made evident, agrobiodiversity fairs were successful in the Altiplano Norte communities not only due to the idea underpinning their creation - i.e. that they would be an incentive for on farm conservation - but also because Bolivian scientists adapted them to the specificities of the local lifestyle and traditions, and to farmers' interests. While some of the "rules" and features of agrobiodiversity fairs were established according to recommendations and best practices from other countries, (i.e. Nepal, Tanzania and Peru - FAO 2006; Jarvis et al. 2000; Sthapit et al. 2006; Tapia et al. 2004), in the Altiplano agronomists allowed farmers to shape them according to their priorities and convenience. Dialogue and the participatory assessment of these events were particularly useful tools. Farmers were put in a position to establish - through their involvement and selective appropriation of these festivals - specific habits and practices that ended up characterising agrobiodiversity fairs in Aymara villages.

In spite of their success, the question arises whether agrobiodiversity fairs can turn into practices that are integrated long-term in indigenous communities' life, and are continued even in the absence of NGOs' and scientists' support. In Okola, where PROINPA was no longer active, agrobiodiversity fairs had disappeared. On one hand, Okola farmers devoted their time and resources to other activities (i.e. community agro-tourism); on the other hand, farmers were heavily dependent on external stakeholders (i.e. NGOs and research centres, through internationally-sponsored programmes) for the funding and organisation of these festivals. Some *okoleños* (particularly ASITURSO members) wished that agrobiodiversity fairs were reintroduced in the community. However, they acknoweldged that they needed external assistance to set them up and requested scientists' support without succeeding. When in 2013 Don Luis from ASITURSO asked tour operators to intercede with PROINPA scientists for agrobiodiversity fairs to be reinstated in his community, he received a negative response. He

was told that other villages were more in need for such support, while Okola could rely on a situation of better welfare and and awareness due to community agro-tourism (Fieldnotes and interviews with two ASITURSO members 19/20-04-2013).

I will now bring the institution of "custodian farmers" back into the analysis, to compare a case of "cultural revitalization" and "selective appropriation" with one of "feigned compliance", if not "resistance". In Cachilaya and Coromata, where scientists introduced it, the concept of "custodian farmers" did not appear to me as particularly successful. As Gruberg et al. argue, and as my own observations confirmed, there was a weak comprehension of it in Altiplano Norte villages, where people would find it difficult to endorse (Gruberg et al. 2013; Fieldnotes 09-2012).

Firstly, the tasks that this role foresaw were unclear to the broader community of farmers and oftentimes to "custodian farmers" themselves. Since their nomination in 2011, "custodian farmers" had been active in gathering seed varieties to create, with the support of PROINPA, a Community Seed Bank (5.4.1). Furthermore, they had participated in training sessions to learn how to manage seed banks and gain better knowledge on the use of agrobiodiversity, particularly in the face of climate change. In the scientists' intentions, this was aimed to turn "custodian farmers" into role models for the rest of community members with regards to the conservation of genetic resources (PROINPA's Annual Report for IFAD NUS III 2012; Interview with PROINPA staff member 03-12-2012). In truth, the formalisation of the role of "custodian farmers" had been a double-edged sword.

Secondly and relatedly, in fact, indigenous farmers did not fully understand the reasons for the identification of "distinct" individuals, who would cover specific and exclusive functions. On one hand, in the Altiplano Norte custodianship was normally shared among the members of families or broader communities. On the other hand, the risk emerged that "custodian farmers" would perceive the work and the responsibilities associated with their role as a burden. In other words, formalising the practice of custodianship, which - as Gruberg et al. also acknowledge - was *de facto* considered typical of all farmers' condition, generated more suspicion and, sometimes, resentment, than benefits.

Last but not least, a language issue with the expression "custodian farmers" ("*agricultores custodios*" in Spanish) made farmers' appropriation of this notion even more arduous. This phrase did not reflect what smallholders perceived as the most important dimension of custodianship - the sharing of seeds. On the contrary, it rather seemed to indicate an idle and selfish practice (Gruberg et al. 2013; Fieldnotes and focus group in Cachilaya 26-09-2012).

At the time of my fieldwork PROINPA, together with Bioversity International and other Bolivian organisations (i.e. CARE Bolivia, Samaritan's Purse and CETHA Túpac Katari), was working to make the institution of and the practices linked with "custodian farmers" more suitable to the reality and the lifestyle of Aymara people. The relevant recommendation of Gruberg et al. - that I agree with - focuses on an increase in farmers' ownership of this role, fostered through a modification of its features according to a participatory approach. According to my analysis, the institution of "custodian farmers" did not awaken farmers' enthusiasm because it did not match farmers' interests and identities. Firstly, the nomination of "custodian farmers" referred largely to an individual dimension of agrobiodiversity conservation, and underestimated the family and community ones. Although "custodian farmers" were supposed to share seeds and knowledge with other farmers, the fact that they were given a role that differentiated them from other community members (and that was not assigned according to a rotational pattern or an elective process) was not in line with the Aymara customs and mentality. Secondly, being a "custodian farmer" did not bring sufficient tangible advantages to the people involved. In an *in situ* urbanisation framework, farmers were eager to explore new *desakota* connections and draw concrete benefits from the activities they got involved in. The strong pull towards a *cholo-mestizo* lifestyle would shape people's preferences, and lead them to giving little consideration to the role of "custodian farmers" - taken on on a voluntary basis and not associated with any material rewards. The farmers who stepped forward to cover it were eager, in principle, to learn from and interact with scientists and urban stakeholders. However, their being "custodian farmers" restricted their focus to the rural realm, as if this were not part of a broader *desakota* framework; did not give them any access to additional business opportunities; and granted them relatively little external recognition.

As a concluding remark, I should point out that in 2012/2013 the institution of "custodian farmers" was new in the Altiplano Norte. In 2014 the "Manifesto of Gratitude to Custodian Farmers of Agrobiodiversity", acknowledging the key role of custodian farmers in on-farm conservation of genetic resources at the national level, was signed in La Paz (5.2). Its perceived value might be bound to change in the future.

7.3 The rediscovery of agrobiodiversity through return migrants

Return migration within the Altiplano Norte was not a significantly widespread phenomenon (5.6). However, in rural communities I came across numerous instances of return migration,

concerning mainly elderly people, who - after spending their adult life in La Paz or El Alto - had gone back to their village, where they were *residentes* (i.e. they owned a house and land).

This process can be called "repeasantization" (Van Der Ploeg 2008), although in the Altiplano Norte this was not determined by the choice of random urban-dwellers to move to rural areas, attracted by the "peasant mode of farming", but by the resettlement of people - belonging to a specific age group - in their own community of origin, after exhausting their working life in the city. These people would go back to relying on subsistence agriculture, which they would, however, side with non-farm income-generating activities at the household level. According to Van der Ploeg (2008), "repeasantization" nowadays often entails farmers' pluriactivity, with the combination of "old" livelihoods with new ones.

In this section I focus on the case of Okola, where new livelihoods were mostly linked with community agro-tourism - a project begun in 2006 following the proposal of a tour operator and the initial participation of a group of former *residentes*[90] (4.2.2; 4.4). I discuss the connections between return migration and agrobiodiversity re-evaluation and rediscovery in a context where "new peasantries"' emerged. The Empire - Van der Ploeg argues - "disassemble(s) existing constellations by eliminating, taking over, and/or redefining strategically important connections" (p.268). "New peasantries" reconnect and re-pattern what was disassembled, through "techniques" such as the creation of new agrofood chains, direct selling, and the reassessment of peasants' visibility with their symbolic and material repositioning (*Ibidem*).

After explaining the positive role of agro-tourism in stimulating agrobiodiversity reinvention, I will highlight some controversial points and possible future scenarios for agro-tourism in this specific setting and in similar ones. The analysis I present is based on the data I collected during multiple visits to Okola in 2012-2013, and a prolonged stay in the community in April 2013, when my research assistants and I were hosted as paying guests by indigenous farmers' families[91].

[90] According to a review by La Paz on Foot and Bioversity International, a group of farmers approached this tour operator in 2006 with the request to support them in the launching of community agro-tourism. At that time, La Paz on Foot was already taking tourists to Okola occasionally in an unstructured and unofficial way (Taranto & Padulosi 2009).

[91] The whole section reflects largely the discussions that took place within the Irfoss team during the fieldwork in Okola (3.3.2).

7.3.1 The case of Santiago de Okola: return migrants, the new entrepreneurs

Return migrants were the main characters of the agrobiodiversity reinvention process in Okola, where the rediscovery of agrobiodiversity was mostly encouraged by farmer families' participation in agro-tourism.

Link return migration - community agro-tourism

Community agro-tourism in Okola was almost entirely run by return migrants (4.4)[92], most of whom were elderly couples that had settled back in Okola after retiring and leaving their adult self-sufficient children in La Paz or El Alto. The first ones who stepped forward to become part of this initiative did it because, thanks to their urban experience, they could understand its potential. Some farmers I engaged with and the staff of the tour operator La Paz on Foot agreed that the entrepreneurial mentality return migrants had acquired in the city was crucial in shaping their support to the project. The director of this agency spoke about a "propensity" that he had noticed among these people - a "propensity" to run the risk of starting a new adventure in the community - and a capacity - in both intellectual and economic terms - to make investments and practically get involved. Return migrants could count on a condition of economic wealth and on more free time as compared to other community members. For example, Don Miguel and Doña Roxana, who hosted me during my stay in Okola, did not get involved at the outset of the project but at a later stage. They planned going back to Okola with the explicit intention of joining the group of farmers participating in agro-tourism. They used their savings to turn the stable next to their house into two rooms for paying guests. They also built a toilet with a shower for the tourists.

Link community agro-tourism - agrobiodiversity reinvention

Agrobiodiversity was a fundamental component of Okola's agro-tourism project. When it was launched within the framework of an internationally funded conservation programme, agrobiodiversity was included as one of its pillars by La Paz on Foot and PROINPA (Taranto & Padulosi 2009). When I visited the community agrobiodiversity was both part of the "package"

[92] The association ASITURSO was officially constituted in 2013 with a membership composed mainly of former *residentes*, followed by some households relying on temporary migration, and two younger families of *pobladores*.

advertised and offered to potential tourists, and an important element of tourists' experience in Okola.

Before analysing the role of agrobiodiversity in Okola's agro-tourism project, I should clarify two points concerning the role and the nature of external stakeholders' involvement.

- **Tour operators/research and development organisations**

At the time of my fieldwork, while La Paz on Foot - a "locally owned and operated travel program and services brand" (*La Paz on Foot website* 2015) - had an active role in the implementation of tourism-related activities, PROINPA did no longer target Okola directly in its work (see 2.2.2).

La Paz on Foot assisted farmers by 1) connecting customers (tourists) with providers (farmers); and 2) offering *okoleños* "training in hygiene, hotel services and other important skills to make (tourists') visit safe, comfortable and enjoyable" (as explained in Santiago de Okola's website). It was PROINPA, however, which had introduced the special emphasis on on-farm agrobiodiversity conservation characterising community tourism in this village. It guaranteed, in the initial phase of the project, support and funding from international agencies, and mobilised its expertise to effectively include a focus on agrobiodiversity conservation and use (Unstructured interview with tour operator 24-01-2013). The idea at its basis was that "it is possible to generate additional benefits (increased income, conservation of germplasm, cultural survival) from local agro-biodiversity via agro-tourism, especially when infrastructure and human capacities are improved", as explained by two of the creators of this initiatives in their paper (Taranto & Padulosi 2009, p.32). A positive link between tourism and agrobiodiversity reinvention exists, and - they argue - it passes through indigenous farmers' self-esteem and the diversification of their economies. Creating and using it for improving farmers' wellbeing and reviving native crops was a guiding principle of Okola's experience. However, how effectively did the actual features of agro-tourism mirror NGOs' intention to build on this connection?

- **Tourists**

The people who showed an interest in agro-tourism in Okola were eager to observe and learn about farmers' habits and livelihoods, by sharing their same lifestyle - i.e. by sleeping in their homes, participating to some of their activities like farming and cooking, or eating the food that indigenous smallholders prepared for themselves with local ingredients. They were, in other words, advocates and protagonists of the "new forms of tourism" discussed by

Mowforth and Munt in their book (p.371). These authors argue that today a growing number of tourists (mainly coming from the West) opt for experiences "off-the-beaten-track" (p.1), perceived not only as sustainable alternatives to conventional package tourism, but also as possible - though partial - responses to development issues in the Third World (Mowforth & Munt 2009).

On one hand it is undeniable that La Paz on Foot was one of the "new tour operators" claiming to sustainability (Mowforth & Munt 2009), as it is evident from the principles at the basis of its activity. Its philosophy was that "travel and tourism can be an effective and positive force for sustainable development, poverty alleviation and biodiversity conservation" (*Okola website* 2014).

On the other hand, agro-tourism in Okola was advertised as "tourism focused on agriculture in all senses - trying local dishes, learning about how (farmers) grow food and understanding more about the threats to farming ways, such as rural-urban migration and globalization" (*Okola website* 2014). It can be inferred that tourists chose Okola as a destination because - besides its beautiful landscapes - it could offer an authentic "real life" experience, based on local participation and benefit-sharing.

Thanks to the mediation of La Paz on Foot, in 2010 Okola gained a space in the Lonely Planet Travel Guide, in which the beauties of Okola, as well as the characteristics and the principles of its agro-tourism project were highlighted.

WORTHWHILE WANDERINGS - LONELY PLANET TRAVEL GUIDE 2010

For an extremely genuine travel experience, don't miss an overnight stay at Santiago de Okola, a tiny traditional fishing and farming community on the shores of Lake Titicaca, approximately three hours from La Paz on the road to Apolobamba and 1.5 hours from the Isla del Sol by boat. With the support of external funding bodies, Okola has formed a community-based agrotourism company to both conserve its rich agricultural heritage and generate income for members. Visitors stay with families in basic but specially designated rooms and participate in daily life. Great beaches, walks and hikes abound, including short hike to the crest of a magnificent rock outcropping (known as the Sleeping Dragon) behind the village with spectacular lake views. Other activities can include weaving demonstrations, a medicinal plant walk and Andean cooking classes.

Attracted by the peculiarity of the experience that is offered, many people visited Okola. Between March and June 2013 ASITURSO members hosted three big groups (over 12 people)

of foreigners[93], two of which spent more than ten days in the community. For farmers these experiences were the first with larger groups and longer stays (Fieldnotes 15-04-2013). Despite some practical obstacles and setbacks, their willingness to replicate similar experiences in the future was a clear sign of their eagerness to further consolidate agro-tourism.

The following elements show the importance of agrobiodiversity in the framework of community agro-tourism in Okola:

- **Website**

In the community's website - available both in English and in Spanish - agrobiodiversity is portrayed as one of the main attractions and, indeed, as a fundamental part of the tourist experience. Speaking on behalf of the farmers, one of its pages states: "the focus of visits to Santiago de Okola is on the rich agricultural heritage of our community in particular and the Lake Titicaca region in general. The Lake Titicaca region is widely considered the center of origin of several crops of worldwide importance, such as potatoes and quinoa. In Santiago de Okola, we conserve more than 40 varieties of potatoes and 8 varieties of quinoa". Emphasis is also put on traditional cropping practices and other activities (i.e. weaving and cooking) that tourists can observe, as well as on traditional foods prepared with local ingredients that they can taste (*Okola website* 2014). Furthermore, a full page is dedicated to the explanation of what agrobiodiversity conservation means and how it relates to agro-tourism in Okola (picture 7.2).

- **Meals**

"To try and stem the disappearance of crop varieties and local preparations of native foods, at Santiago de Okola we try to share our food traditions with tourists", says the website of La Paz on Foot. With the purposes of preserving local diets and reviving native ingredients and agricultural diversity, foods prepared mainly with products grown by the farmers themselves are served to tourists. To cook for the Irfoss group, while we were paying guests in the community, farmers used local crops (*papa*, quinoa, papalisa, oca, maize, broad bean). Besides presenting dishes that were typical of the Aymara tradition (quinoa soups, *kispiña*, boiled tubers, *chuño* and *tunta*, or legumes with cheese, accompanied with *ají* sauce) farmers also

[93] In summer 2013 the community hosted tourists from a number of countries, including Canada, the United States, Germany, Italy, Brazil and Argentina.

relied on new recipes that they had learnt by participating in NGOs' workshops[94]. For example, during my stay in their home, Don Miguel and Doña Roxana gave me quinoa and vegetables *tortillas*, quinoa burgers, quinoa *humintas*, and drinks prepared with barley or quinoa. In response to my questions, Doña Roxana would chat with me about the specific varieties she had used for cooking and explain the reasons why she had chosen certain ones instead of others for the preparation of the dishes she offered (i.e. their texture, their boiling time, their specific taste).

Picture 7.2: The website of Okola on agrobiodiversity and agro-tourism's role in its preservation

http://www.santiagodeokola.com, 06-2015.

- **Tourists can *see* agrobiodiversity**

As part of their experience in Okola, tourists get to *see* the Andean agrobiodiversity - in agricultural fields, from farmers' hands upon request, in their plates when eating. Community agro-tourism offers visitors the opportunity to familiarise with agrobiodiversity - for most

[94] While La Paz on Foot, through other partners (i.e. ViSozial) trains ASITURSO members on hygiene and hotel services, to allow farmers to offer tourists a safe and pleasurable experience, PROINPA has mainly held "agrobiodiversity use differentiation" (i.e. cooking) workshops.

guests for the first time in their life. In April 2013, when my research assistants and I stayed in Okola, farmers had just harvested their tubers, and it was easy for them to show us the seeds they had selected by taking them out of their storage space for us. We also participated together with our hosts in the harvesting of their plots, came into direct contact with agricultural varieties and got the chance to ask smallholders for explanations about agrobiodiversity, agricultural practices and the different uses of varieties. Picture 7.3 shows one member of the Irfoss team holding a conversation with his host while she cleanses and selects quinoa seeds. Finally, some of us (mostly women) accessed our hosts' kitchens and observed or participated in cooking activities. We saw with our own eyes how different crop varieties were used in the preparation of meals.

Picture 7.3: Tourists can participate in their hosts' activities and discuss agricultural practices and seed varieties

Picture by Francesco Rufini, 04-2013.

- **Community museum**

Okola has a community museum, located within the school complex, because of both the availability of a room in one of the buildings, and the intention of those involved in its creation to establish a link between youth, agro-tourism and agrobiodiversity. Opened in 2010 and set up with the collaboration of the agro-tourism project partners[95], it displays "artefacts of past and present life in Santiago de Okola, with a focus on […] cultural activities and the ecology of Lake Titicaca" (*Okola website* 2014). In 2013 posters and pictures showed the main livelihoods

[95] UCODEP (an Italian NGO), PROINPA and ViSozial (the social outreach programme of the German tour operator Viventura).

of the community (i.e. fishing, farming). Agrobiodiversity, in particular, occupied a whole section of the museum, with information panels about *ex situ* and *in situ* conservation, and about species and varieties maintained in the community. It was open to visitors and tourists.

Picture 7.4: A traditional authority from Okola visiting the agrobiodiversity section of the community museum

Picture by Riccardo Bononi, 04-2013.

Some critical issues connected with community agro-tourism

Community agro-tourism brought numerous advantages to the people of Okola (i.e. additional income, improved living conditions, visibility for the community and its products). Furthermore, it provided an incentive for farmers to value on-farm agricultural diversity, in light of the attention it received through this initiative and of the new uses that crop varieties were given (5.5.7).

Agro-tourism, however, also presented *okoleños* with a series of challenges. Some controversial points emerged from an analysis of community agro-tourism practices, particularly with reference to its future sustainability and its survival in the current form. Below I discuss some critical aspects of agro-tourism in Okola, and reflect upon its viability as a project aimed at reviving agrobiodiversity. In our discussions my research assistants and I agreed that, although agro-tourism had a significant potential as a trigger for agrobiodiversity reinvention, there were risks embedded in its implementation, regarding, in particular, the specific purpose of promoting on-farm agrobiodiversity maintenance and use. Below I firstly examine some challenges that the community faced. Then, I focus on issues specifically

connected with agrobiodiversity conservation and use. Finally, I reintroduce the aspect of migration.

1) Dependency

In Okola's website farmers state: "The aim of our company is to be self-sufficient so that we can receive visits from national and international tourists and manage most if not all of the process ourselves" (*Okola website* 2014). By interacting with ASITURSO members it was clear that they were quite proud of the improvements they said they had achieved since the launch of agro-tourism. Farmers had refurbished and expanded their homes, learnt how to take care of tourists according to adequate standards, and obtained legal capacity as an association, enhancing their capacity to offer homestays worth their price. However, they still relied on the support of external actors heavily[96] and some of them were well aware that they were not yet self-sufficient.

Firstly, the mediation of tour operators was crucial in their interaction with tourists. Secondly, although the group could count on a solid economic basis deriving from the income already generated, it still relied on NGOs' financial and material support, used in both agro-tourism, and projects concerning education and irrigation. Thirdly, the coordination of agro-tourism-related activities was entirely entrusted to one person - Don Luis, a former *residente* and the *de facto* leader of ASITURSO. Don Luis hosted - during our stay - three people from the Irfoss group. Furthermore, because he was the only farmer whose home had a small living room (i.e. a room in the house with a table and beches, not used for sleeping) we would hold our the evening meetings there when it was too cold to sit outside. We noticed that Don Luis was extremely respected and appreciated. Other community members, particularly ASITURSO people, would often show up at his door to ask him for advice or permission regarding different issues - both linked with tourism and concerning other matters in the village. However, we also agreed that 1) he was old and could not bear alone the burden of his numerous tasks; 2) his role as a mediator between farmers and external stakeholders was probably delaying the creation of a more structured and self-sufficient group of service providers, in which responsibilities were shared and the interaction with tourists, travel agencies and NGOs occurred through established channels.

Farmers did not seem to be aware of the long-term unsustainability of this condition of dependency from external actors. Despite the entrepreneurial mentality of most ASITURSO

[96] For example, in 2013, the German charity ViSozial was providing aid - used particularly in education initiatives - and coordinating a programme of distance adoptions.

members, external support was requested and accepted as the easiest way to obtain what they needed.

Indeed, most farmers understood the potential of agro-tourism to the extent that many of them spontaneously inquired about selling opportunities, and explored on their own possible avenues for increasing their profits. They eagerly asked the representatives of La Paz on Foot whether any tourists had contacted them for visiting their community. Some particularly far-sighted people even requested that trainings were held for farmers to acquire further knowledge and skills, in order to run the tourism business properly. For example, when in March 2013 an NGO representative paid one of her usual visits to Okola, farmers showed some uncertainty about the correct way of preparing breakfast for their guests. She and the farmers jointly decided that a training session (a "*curso de desayuno*" - a "breakfast course") would be held, especially to the benefit of ASITURSO's most recent members. One of the senior associates even showed a particularly encouraging attitude towards the newest ones, and pushed the NGO staff to schedule a training session as soon as possible (Fieldnotes 21-03-2013). While this episode reveals how farmers are genuinely impatient to improve their skills, it is also a further demonstration of how dependent they are on the guidance of external organisations.

2) Exclusion

Participation in agro-tourism was limited to a restricted number of community members. Scientists, tour operators and current ASITURSO members persistently underlined that the association was not formed on an exclusionary basis. The farmers who were not part of it had shown either scepticism towards tourists, the success of the project, or its management; or inability to offer adequate services to tourists, because of their lack of infrastructure, time or economic resources.

By interacting with non-member *okoleños*, it emerged that while some of them had spontaneously backed off, some others believed they had been rejected by the *de facto* leadership of the association for more or less arbitrary reasons (i.e. "your house is not big enough"; "you are not originally from Okola"; "you have a job in the city and you don't have enough free time" - Interviews 04-2013). The exclusion of some people and their "enduring" of tourists and tourism-related activities carried out "in their backyard" were factors generating conflicts at the community and inter-community level.

3) Conflicts

Conflicts between ASITURSO members and the families not participating in agro-tourism were not infrequent. Non-members bore the inconveniences caused by the presence of "intruders" in their village and by ASITURSO people's disproportionate use of common resources. This generated hostilities, which would often break out as arguments during community gatherings (Fieldnotes from a festive event on 24-01 and an authorities' meeting on 28-03-2013[97]). Furthermore, tourism caused social and welfare inequality, with the creation of primary and secondary beneficiaries.

The agreement that existed between ASITURSO and the broader community was that the advantages drawn from agro-tourism had to be shared among all community members, in a spirit of "restitution" to the whole village. When we were in Okola some ASITURSO farmers informed us that part of the gains obtained from tourism until that moment had been reinvested in the implementation of education and school infrastructure refurbishment initiatives, under the coordination of external organisations. Although the benefits that tourism brought to the community at large went beyond this direct transfer of money, what *okoleños* perceived was that the contribution of ASITURSO to the overall development of the village was very limited as compared to the "extremely high revenues" that its members gained ("*Los del turismo ganan un montón de plata. Se vuelven ricos y no comparten nada con los demás. Se guardan todo*" - "The tourism people earn loads of money. They become rich and don't share anything. They keep everything for themselves" - Interview with a farmer not participating in agro-tourism 21-03-2013).

The agro-tourism project was also responsible for conflicts between Okola and its neighbouring communities (4.2.2).

[97] In March 2013 I took part in a community meeting attended by the members of the *junta escolar*, three traditional authorities, two representatives from ASITURSO, and a member of ViSozial staff. In front of these eminent personalities I explained that I would shortly go to Okola with a group of 12 Italian people, who would spend two weeks in the village, hosted as paying guests by ASITURSO farmers. Visitors would also carry out some activities with schoolchildren, according to an agreement with the school director. Although I immediately clarified that my group would offer a photography workshop to Okola's students and that we would supervise and contribute to the reorganisation of the community museum, with the additional gift of 10 new pictures, traditional authorities and *junta escolar* members expressed their concern that ASITURSO members would be the only ones to draw a tangible gain from our presence in Okola. While some *junta escolar* members insisted that we contributed economically to the purchase of uniforms for the school's athletics team, one ASITURSO representative tried to dissuade them from officially advancing such a request. The tone of the discussion became tense when one traditional authority expressed his frustration about ASITURSO members always trying to keep for themselves the gains they obtained from tourism (28-03-2013).

4) An "*Isla del Sol*-like transformation"?

The Island of the Sun (*Isla del Sol*) - located in Lake Titicaca at about 1.5 hours by motorboat from Okola - is one of the main tourist destinations of Bolivia. Tourism is the main livelihood for its inhabitants - indigenous Quechua and Aymara people, who are also farmers and herders - particularly for those who live in its Southern part, which attracts most visitors. Here tourism is such a predominant source of sustenance that when in April 2013 a strike blocked the access of vehicles to Copacabana, interrupting all transportation connections across the Tiquina strait, food was not available on the island, neither for its inhabitants nor for the few tourists who had managed to reach it by using alternative routes. For the whole duration of the strike tourism almost stopped. I had the opportunity to visit the *Isla del Sol* with my Italian research assistants immediately after the end of the blockade. The usually crowded paths and hotels were still half empty, and a very narrow selection of dishes was available in restaurants. There - restaurants' staff told us - the meals offered to tourists were not prepared by using the local agricultural production. All ingredients (including tubers and grains, as well as fish) were bought at a cheap price in the mainland and shipped to the island via Copacabana (Fieldnotes 13-04-2013).

Due to the exceptional fame of the island as *the* regional tourist attraction, and Okola's proximity to it, some farmers viewed the Isla del Sol as a model, which the future development of their community tourism experience should be based upon. Particularly in the eyes of the youngest and most ambitious ASITURSO members, the achievement of economic wealth through tourism, and the perspective of shifting livelihoods in favour of tourism and to the detriment of agriculture looked appealing (Interviews with Okola farmers 04-2013). The dreams of some were also spiced up with some "grandeur" plans. Martín, the youngest agro-tourism participant, was fascinated by the size of the hotels and of the tourism business in the *Isla del Sol* that he had visited a few times. He dreamt about building a hotel in Okola as well, where - he said - he and his family could work. When we asked who would have taken care of plots and crops if their time had been entirely taken by the management of a hotel, he replied half-jokingly "*Si hay hotel de nada sirven los cultivos*" ("If we have a hotel, we don't need any crops" - 23-04-2013).

In the Island of the Sun the food we were offered was of relatively poor quality. Restaurants used ingredients that they called native, like quinoa or trout, but supplies would come in truth from far-away markets and had a much lower price than what tourists paid for in their meals. While, on one hand, the indigenous cuisine was marketed to attract tourists - and this indeed ensured jobs, generated income, and valorised the lake's culinary tradition (as in Parasecoli 2012) - on the other hand, it had succumbed to commercial interests, as ingredients most of

the time were outsourced and Western dishes (i.e. pizza or lasagna) were often offered alongside 'typical'/'authentic' indigenous ones.

Due to their economic-gain-driven mentality and their pull towards an urban-like lifestyle, Okola farmers, especially youth, tended to assimilate the features and the success of the *Isla del Sol*'s tourism with the future of their own experience. As the next points clarify, this was due to the lack of a full understanding of 1) what made the experience offered to tourists in Okola peculiar - i.e. its small scale, homestays, the agricultural/agrobiodiversity component; and 2) the role of agrobiodiversity, which was central not by lack of other resources, butbecause it had intentionally been assigned an intrinsic value that the whole agro-tourism project depended on.

5) The tourist gaze

In settings similar to Okola's the possibility exists that the "tourist gaze" is returned to the tourists (Urry 2002) through a process of ethnicity reconstruction that local people put in place to please and satisfy their visitors and gain additional economic benefits (MacCannell 1973). It would be an exaggeration to say that a situation of "staged authenticity" (MacCannell 1984) is what we observed in Okola. It is legitimate to believe that most practices shown to and shared with us as tourists (i.e. agricultural activities, weaving, fishing, medicinal herb picking) were carried out by indigenous farmers also when we were not there, as they were part of their normal lifestyle. Secondly, given the relatively small size of the project (only a group of families was involved in agro-tourism), most people in the community maintained their usual habits also in our presence.

It is undeniable, however, that the tourist setting was to a certain extent artificially prepared by *okoleños*, under the guidance and supervision of tour operators, with the intention of suiting visitors' supposed preferences and habits. Besides homestays characterised by appropriate standards of hygiene and comfort, we realised that we were offered, as paying guests, a partial and often altered view on Aymara people's lifestyle. Because I had experienced living in other Altiplano Norte communities, I could make this assessment better than my research assistants. They, however, also reached the same conclusion by relying on other observations. By looking, for instance, at meals we noticed that there was a difference between the food that Okola farmers gave us as paying guests (often "new foods" - table 7.1) and what they ate when they were on their own. One example concerns the traditional meal *apthapi*, originally based on the principle of sharing food amongst participants. As a group we could request to have this meal prepared for 25 Bs. per person. The price was higher than "normal" meals, because *apthapis* were much richer, and included special and more elaborate

dishes. We had *apthapis* three times during our stay. Consuming an *apthapi* indeed gave us an idea of festivity and an illusion of authenticity, because of the unusual abundance of "traditional" food, and of the fact that farmers presented it and we perceived it as something special. In other words, both our hosts, who met to cook together and serve the food as a team, and ourselves, who had to decide in advance to have this meal and therefore waited for it with curiosity and excitement, contributed to conferring it a solemn character. Several modifications to the traditional *apthapi* had been introduced to suit tourists' expectations - in particular their idea of a different and celebratory meal and Western eating habits.

- We consumed our *apthapis* at lunchtime as buffet meals at a big table in the house of Don Luis. Cups and drinks were there for us to help ouselves during the meal. Plates and cutlery were provided. As I observed in numerous occasions in other communities, *apthapis* were normally consumed by farmers after merging in *aguayos* laid on the ground the food that each of them had brought. After a thanksgiving prayer, everybody could take what they preferred by using their hands, and drinks were never consumed during the meal, but shared at the end if any bottles of *refresco* (soft-drinks) were available.
- Hosts served dishes to us wearing green aprons with the Santiago de Okola logo.
- Many "new foods" were included. As point 8 clarifies, not only did farmers normally eat less elaborate food (5.5.1; 7.2.3), but even in Okola, where "new foods" were regularly cooked, farmers tended to reserve these exclusively for tourists, eating them only if they had been prepared in excess or left by their guests.
- Farmers did not join us. We ate out *apthapis* on our own, while they waited or worked outside. They consume dtheir meal together but separately from us.

Although what we were offered was a quite different and arguably non-authentic version of the traditional meal normally consumed by farmers, preparing *apthapis* for their guests - we noticed - was an important moment for ASITURSO members to share recipes and tips on the dishes they prepared and the ingredients they used, and to learn from each other by working together.

6) Partial awareness of tourists' interest in agrobiodiversity

Until 2011 (when Okola was still one of the target "micro-centres" of PROINPA's projects) the community had hosted agrobiodiversity fairs yearly and farmers had participated in relevant trainings and workshops organised by scientists. Tour operators had also instructed farmers on the special role of agrobiodiversity in agro-tourism. As a consequence, most farmers we interacted with said they knew that conserving agricultural varieties had an important value.

Farmers, however, could not appreciate fully the extent to which tourists were actually interested in the agricultural varieties they conserved, their knowledge, and their agricultural practices. The average tourist, we learnt from tour operators, travelled to Okola to live an "authentic" experience in a rural indigenous community, rather than to explore farmers' fields in search for neglected and underutilised crop varieties. In fact, most people arrived to Okola as part of longer trips throughout Bolivia or, sometimes, tours across different Latin American countries. Tourists' perception of agrobiodiversity was, overall, limited to an acknowledgement of its existence, based on second-hand information (i.e. included in Okola's website or in the community museum, or reported by farmers themselves). Some people before us had visited Okola for data collection purposes (a few individuals and small groups), but farmers had perceived them as scientists, affiliated with some research organisation, rather than as tourists.

The people of the group that I brought to Okola in 2013 were the first who spent an extended period of time in the community, as both paying guests/tourists and researchers. The high degree of curiosity of my research assistants and their questions and requests surprised more than one farmer, as not all hosts were fully aware of the activities and objectives associated with our visit. Used as they were with less inquiring and "problematic" guests, some farmers gave our questions superficial responses and were not willing to share with us some moments and activities (like harvesting, or cooking), which they perceived as "work", and which tourists should not take part in.

This reflection does not want to be judgemental towards the farmers, who were extremely polite and open towards us - "out of the ordinary" tourists. It aims, instead, at emphasising the partial consciousness that many of them showed concerning the diversity of interests that can push visitors to their community. Some *okoleños*, for example, reacted with surprise - even shock - when they heard that we did not want to sign up for a *taller de tejido* (weaving workshop), but that we rather preferred to accompany them to their fields to learn about their activities as farmers[98].

For ASITURSO members their experience with our group was indeed a "first" in many ways - we were the first group of tourists who were genuinely interested in on-farm agrobiodiversity conservation; who wanted to go beyond the established tourists' itineraries/routines; who invaded some spaces that farmers considered private and non-interesting, and that, therefore,

[98] The *talleres de tejido* are held for tourists by some ladies of the community upon payment of a fee of 40 Bs. per person. Obtaining a monetary gain was indeed a reason why our hosts would encourage us to attend these workshops, besides this being one of the conventional occupations chosen by tourists during their stay in Okola. In addition to this, our eagerness to go with farmers to their fields was perceived by some of our hosts as an odd intrusion from our side in their daily activities.

they normally excluded from the realm of tourism; who asked questions about the use of agricultural varieties in meals and people's choices in farming, cooking and eating. This justifies in part the puzzled reaction of some farmers to our requests. However, it also shows that there was an imbalance between the remarkable token value attributed to agrobiodiversity in both discourse and publicity, and its actual weight in the tourist experience.

7) Farmers' gastronomic offer to tourists

Following up on the previous point, I should underline how the nominal emphasis put on agrobiodiversity in the framework of agro-tourism was often not reflected in farmers' choices concerning our/tourists' meals. On one hand, farmers tended to use mainstream varieties (i.e. *papa Huaycha* or *Wila Imilla*) much more than neglected and underutilised ones for the preparation of our food - as they normally did also for the preparation of their own. On the other hand, while we were always offered dishes cooked by using mainly local ingredients, we were not given any explanations about the specific agricultural varieties that were used in each dish.

Based on these facts, I would like to make some considerations that retrace the reflections made in the Irfoss group's discussions. Firstly, in Okola's agro-tourism project an important opportunity is being missed with reference to both farmers' and tourists' awareness of the agronomic, culinary, gustatory and nutritional properties of crop varieties. If farmers were encouraged by NGOs and tour operators, as well as by agrobiodiversity-educated tourists, to pay more attention to the use of agricultural diversity in consumption, they would become more aware of varieties' different uses and of the wide range of possibilities (i.e. concerning cooking and nutrition) that agrobiodiversity offers. A link between agro-tourism and a niche product market for neglected and underutilised varieties (Narloch et al. 2009) would be created. Moreover, if farmers transmitted this knowledge to tourists, raising further interest in agrobiodiversity conservation among those who already chose an alternative type of vacation, a positive process of mutual sensitization and value attribution could be triggered. Such a process would stimulate farmers to opt for a more substantial inclusion of neglected and underutilised varieties in tourists' meals, and in the long run their own consumption preferences would be as well affected. If the desire to please the tourist exceeds the will to offer meals that are consistent with the principles of agro-tourism, as they are advertised, the ultimate outcome might be that farmers, instead of preserving and using local varieties to prepare tourists' meals, use exclusively mainstream ones, or products purchased in the market. These might become "easy to get" once the earnings deriving from tourism are such that buying them is more straightforward than using locally grown ingredients.

These emerged as pure speculations. However, during our stay in Okola we did indeed notice that, while in the morning some farmers cooked quinoa pancakes and tortillas for their guests, some others would buy bread from the city through their rural-urban networks and offer it to tourists in a continental-style breakfast[99]. Furthermore, only some farmers were willing and able to provide explanations to guests about the specific varieties they had used in the preparation of meals. Otherwise, it was often necessary to insist to make our hosts engage in conversations on this topic, overall regarded as insignificant or uninteresting[100].

8) New uses of agrobiodiversity in cooking exclusively reserved for tourists' meals

As explained in 7.2.3, thanks to PROINPA's trainings, farmers learnt new recipes with native ingredients. In Okola new dishes were regularly cooked. However, most of the time, they were exclusively given to tourists. After their exogenous introduction, the process towards their integration in the local diet was clearly slow, as farmers mainly persisted with their usual consumption habits, nullifying in part scientists' effort to introduce "new foods" with the purpose of diversifying native crops' use.

By participating in some community events, I could see that ASITURSO members frequently prepared *tortillas*, quinoa pancakes and burgers, and *refrescos* made with locally grown cereals in the special occasions in which donors, representatives of NGOs, and tourist agencies were involved. This indeed made them and the other community members who ate them familiar with these foods. Furthermore, thanks to the cooking skills and commitment of some farmers (mostly women), Okola had gained the fame of a place where the food was healthy (due to the proximity of the lake) and tasty. "*Se come rico en Okola*" ("The food is good in Okola") is a sentence I heard multiple times from scientists, tourists, and NGOs' staff. This speaks in favour of the possibility that Okola might become a prominent destination for gastronomic tourism in the future.

9) Out-migration continues

Community tourism was an important factor in the choice of return migration amongst *okoleños*. Nevertheless, there was a certain concern among farmers, as well as in NGOs and

[99] Being 13 people meant that during our stay in Okola in April 2013 we were hosted in tiny groups (of 2 or 3 components) by different farmers' families. Comparing meals and use of local ingredients across the whole association was easy. Our sample allowed us to cover all members, as farmers - halfway through our stay - asked us to move houses, with the purpose of sharing among all of them the burden of hosting such a large group, and giving all associates the possibility to equally gain from our presence. All farmers offering homestays, then, hosted some people from my team.

[100] I should particularly thank Marléne-Shiva Vezzaro, a participant in the "Workshop of Visual Anthropology and Field Research - Bolivia 2013", for her insights and work on these issues.

travel agencies, about the future of this initiative. Migration was acknowledged as a serious problem for the community, associated with a gradual loss of agrobiodiversity and Andean foods. The website of La Paz on Foot states: "As older people die and younger people migrate from rural areas to urban centers in Bolivia and abroad, the crop varieties and the ways that crops are used tend to decrease. There is less demand for certain varieties and certain dishes and a "Westernization" of tastebuds takes place, as consumers seek exotic (and often cheaper) foods, in the case of the Central Andes foods such as rice and chicken" (*La Paz on Foot website* 2015).

As shown in 6.4.2, young people, attracted by a *cholo-mestizo* lifestyle, demonstrated little interest in becoming personally involved in community tourism, not considered as a viable and equally exciting alternative to rural-urban migration. Although it was successful and financially rewarding for ASITURSO participants, there were not sufficient elements - at the time of our stay in Okola - to attribute to community agro-tourism the role of disincentive against out-migration. Youth, in particular, seemed to be extremely eager to leave their village (4.2.2; 6.4.2) in response to the irresistible call of the city. A trend reversal of the migration flow was not in place. However, in the future there might be an increase in the participation of youth in community agro-tourism. A sign of this possibility was the spontaneous involvement in 2013 of two young couples of farmers in tourism-related activities.

7.4 A new institutional and socio-economic scenario

The process of agrobiodiversity "reinvention" analysed so far takes place in Bolivia within a new institutional and socio-economic scenario, where the main characters, besides farmers, are migrants, tourists, urban buyers, and national and international research and development organisations. With the rediscovery of the country's indigenous roots and the emergence of a celebrative rhetoric - connected with the activity of international organisations and the current political leadership - native crops are at the centre of a revival (2.3.2). Section 5.7.1 retraced the landmarks of a transformation, occurring in Bolivia both in institutions and in mainstream discourse, which has placed a new attention on agrobiodiversity conservation and the role of indigenous farmers. This section, instead, looks at the Altiplano Norte's socio-economic changes, with a special focus on food consumption.

According to Zimmerer, globalisation - stemming from a neoliberal economic logic and promoting market integration - often bears product uniformisation as a side effect. However,

at the same time, it can cause an increase in people's propensity and capacity to preserve agrobiodiversity at the local level. It can modify consumers' preferences and enhance biologically diverse goods' popularity. It can also stimulate the creation of social movements in favour of organic agriculture and local foods (Zimmerer 2010).

Although not reaching the same scale and degree of international resonance as the "boom" that is transforming the Peruvian gastronomy, Bolivia is currently experiencing - in its own smaller way - a culinary revolution. In the Altiplano Norte wealthy white and *mestizo* people from the upper class of La Paz appreciated native crops and traditional dishes, revalorised by chefs with new and sophisticated recipes. Partnerships between privates, civil society organisations and public institutions contributed to a phenomenon of Andean products' and cuisine's revival, which resembled the success of the "*cocina novoandina*", made famous and fostered in Peru by the chef Gastón Acurio (García 2013; Ypeij 2013). Movements like the "*Movimiento de Integración Gastronómico Boliviano*" (MIGA), aiming at the revaluation and promotion of the "*Patrimonio Alimentario Regional Boliviano*" ("Bolivian Regional Food Heritage"), were very active at the time of my fieldwork, linking producers, transformers, chefs and consumers, and "elevating the country's natural, cultural and culinary richness and diversity" (transalted from the MIGA website 2015).

This "ruralisation" of tastes (Pinedo-Vasquez & Padoch 2009) does not only interest the social and intellectual elites of La Paz, but also the more recent urban dwellers. The *cholo-mestizo* people of El Alto, for example, while privileging the foods and habits typical of the richer and more globalised social groups (i.e. with a consumption of great quantities of meat and alcoholic beverages, and an attraction towards fast foods - 4.5), also enjoyed having food coming from *el campo*. Their eating preferences had created an urban market for these products.

These processes raise some critical issues. Nevertheless, they contribute to the creation of a setting that favours agrobiodiversity "reinvention" in consumption - by merging new and old needs, interests and habits.

7.4.1 The "ruralisation" of tastes in urban areas between haute cuisine restaurants and nostalgic rural migrants

A "gastronomic boom" and the elites' new consumption choices

In the process of agrobiodiversity "reinvention" that I observed the hesitant commencement of a gradual but steady transformation of tastes and food consumption patterns in the city played an important role. Using the words of Parasecoli (2012), while indigenous farmers strived to acquire a *cholo-mestizo* lifestyle, the wealthiest components of the Bolivian society experienced a "rekindled interest in […] culinary traditions, local products and artisanal delicacies" and an attraction "toward the rustic food of the countryside" (p.209). According to Parasecoli, this is common to numerous urban areas in the developing world. While "until a few years ago, traditional ingredients and dishes would have been considered embarrassing and uncouth, being uncomfortably close to rural realities", today "growing numbers of consumers are learning to appreciate the role of local communities and their traditions, the manual skills and the know-how of food producers". Particularly in Latin America the "limited but growing upper classes with disposable incomes have recently shown a shifting sensitivity about the cultural relevance of food traditions" (*ibid.*).

This is what has happened in Peru, where a "gastronomic boom" is underway. Following the initiative of chef Acurio, the iconic and material leader of a "food revolution" officially begun in 2011, Peru has embarked on a journey towards the revalorisation of the country's cosmopolitan culinary tradition, with the purpose of enhancing the cultural and economic integration of a fragmented nation and of exporting a rebranded gourmet cuisine (the so-called "*cocina novoandina*") to the world[101]. The main strategy adopted to trigger this process was the rediscovery and revaluation of traditional ingredients through the development of new "alternative" traditional dishes that moved them from "savage" to "sophisticated" cuisine (García 2013, p.511). As Finnis acknowledges, when marginalised foods and traditional cuisines and practices are incorporated into mainstream consumption behaviours, it is not enough to simply reintroduce products and tastes to new customers. These must be "reimagined and re-

[101] This rebranding was not only ideal. In 2011 the label "*Marca Perú*" was launched through a campaign that symbolically started with the pacific invasion by a group of Peruvian celebrities of the town of Peru, Nebraska, with the aim of bringing the best of their home country to its inhabitants. Video: https://www.youtube.com/watch?v=nFtmSE5oPDA.

presented in strategic ways in order to garner public attention and interest, and to reconfigure their association with lower-status food practices" (Finnis 2012, p.2).

The Peruvian culinary transformation was heavily criticised for being a commercial project in which - while multiculturalism, tradition and nature are commodified as part of the country's neoliberal agenda - the existing social and economic inequalities are exacerbated with negative effects for indigenous peoples and farming (Ypeij 2013; García 2013). Processes like the on-going gastronomic revolution frequently embed not only opportunities but also negative outcomes for "longtime consumers" of certain goods and for existing production patterns (Finnis 2012). The limits of the inclusionary rhetoric of the *novoandina* cuisine are highlighted by those who argue that the declared mission of its promoters to eliminate discrimination and exploitation, and stimulate development through food and the establishment of new alliances between producers, consumers and chefs, is in truth just disguising the "enduring coloniality of Peruvian social relations" (García 2013, p.521). On one hand, products celebrated as iconic (i.e. quinoa) become highly requested by wealthy consumers, while rural communities' access to them gets difficult and their production must resettle on a narrow range of goods that meet market demands. On the other hand, "cultural and political ventriloquism" becomes the norm, "as non-indigenous people speak on behalf of indigenous populations" and benefit from a boom that relies on native recipes and ingredients but does not seriously adopt reciprocity logics (*ibid.*).

This gastronomic revolution, however, is indeed a success. In Peru it has generated opportunities that benefit the whole country's economy, and a business cluster that has turned Lima into a culinary mecca - with restaurants currently accounting for 3% of the national GDP (The Economist 2014). "*Mistura*", the gastronomic festival associated with Acurio's initiative, attracts yearly thousands of visitors from Peru and abroad, as well as a significant media attention (Ypeij 2013). Its very name means "mixture", and indicates the "fusion" between new and old, and between different geographical areas and cultures (*ibid.*) - the concept at the basis of this culinary fair.

This particular aspect, as well as the same controversial issues discussed above with reference to the Peruvian food trends, also characterises the Bolivian gastronomic revolution, which - although taking the neighbouring country as a model - is occurring on a smaller scale, but with similar features and intents.

Firstly, the gastronomic boom in Bolivia is supported and advocated for by a foundation - "Melting Pot", created by the Danish celebrity chef Claus Meyer - and the ACB, the *Asociación De Chefs De Bolivia*. Just like in Peru, its promoters seek to "revive indigenous ingredients and recipes" (as emphasised several times during the "*Feria Tambo*" and annexed workshops - Fieldnotes 13-10-2012). As a result, in some exclusive restaurants of La Paz I could find dishes like quinoa lasagna*,* quinoa sushi or native tubers puree on the menu. In upper class and expat parties there were quinoa quiches and burgers, prepared by particularly skilled and innovative cooks and *empleadas* (Fieldnotes from La Paz 02-06-2013). People from urban elites showed appreciation for famous chefs like the Bolivian Rita del Solar, the "queen" of quinoa - Del Solar, in particular, glorified "the golden grain of the Andes" through the publication of a popular recipe book (Gómez 2012; Del Solar 2005). Food schools (like the GUSTU Food School and Restaurant in La Paz) were there to train young Bolivians as the next generation of chefs for gourmet restaurants.

Secondly, snacks and drinks merging an appealing and "modern" look with the use of indigenous ingredients, disregarded for a long time and excluded from the preparation of packaged food, could be found. An example is the chips of native *papa*, "*Nativa*", commercialised in Cochabamba by the local company Pa&Pa[102].

Thirdly, festivals similar to the Peruvian "*Mistura*" (i.e. "*Feria Tambo*" and "*Biobolivia*") were taking place. "*Tambo*", in particular, just like "*Mistura*", combined the showcasing and sale of "fusion" dishes (blending traditional and modern culinary choices and ingredients from different regions and food histories of Bolivia) with conferences and concerts, and attracts a large number of visitors (5.5.6, 5.6 and 7.2.3).

This festival, together with other events that livened up the *paceña* cultural scene, was inspired and promoted by MIGA, which - similarly to the Peruvian chefs' network - is founded on the idea that a link exists between food security and food sovereignty, development and poverty reduction, and the revalorisation of different national products and cuisines through gastronomy (*MIGA website* 2015). "*Tambo*" was conceived by organisers as a platform for encounters and exchange between different food chain actors (Fieldnotes 13-10-2012).

[102] The promoters of this product themselves acknowledged that its buyers were people from the Bolivian upper-middle class, who, because of their stronger social responsibility, were willing to purchase and consume a product that did have superior nutritional properties and used local tubers but was indeed unusually expensive (a confirmation of this is on PROINPA's website).

Picture 7.5: Chips of native *papa*

Nativa, http://www.potatoworld.de/bolivia/nativa-home-e.htm, 06-2015.

Agrobiodiversity is an important element of this gastronomic transformation, as the two facts below demonstrate.

1) The production and diffusion - through collaborations involving international organisations (i.e. FAO), Bolivian NGOs and public research and conservation institutes (i.e. PROINPA and INIAF), and governmental institutions (i.e. the Ministry of Cultures and the Ministry of Rural Development and Land) - of a series of recipe books exalting indigenous crop varieties as ingredients for dishes that merge tradition and innovation. Some examples are the "*Recetario de Papas Nativas*" published in 2008 within the framework of a project of Fontagro [103], and the "*Recetario Tradicional de la Quinua: Tradición y Vanguardia*", published by FAO in 2014, following the "International Year of the Quinoa".
2) The commercial partnerships established between farmers' associations and private stakeholders thanks to the increased awareness and interest of not only retail and catering companies, restaurants and cafes, but also of the Bolivian and international consumers (i.e. mainly tourist or expat). An example - already mentioned previously (5.5.6, 7.2.3) - is given by the Bolivian most famous coffee shops chain "Alexander Coffee", which in 2008 led a campaign to raise awareness on the nutritional, cultural and economic value of three Andean grains - quinoa, cañahua and amaranth. Because of their stigmatization and lack of

[103] Fontagro is "an alliance of Latin American and Caribbean countries that supports research and innovation in agriculture" (*Fontagro website* 2015). The recipe book that was published as part of one of Fontagro projects specifically focused on the use of different tuber varieties. For each recipe it was indicated which specific variety was the most suitable for the best result (Campos 2008).

competitiveness, these grains were not normally used in urban cafes. Alexander Coffee, by sourcing ingredients from Bolivian rural communities, introduced novel dishes like amaranth muffins or quinoa salads, and informed customers through leaflets and advertisements about historical and nutritional facts concerning these menu entries. Given its specific clientele, Alexander Coffee's campaign reached - through an "innovative, practical, culturally sensitive and attractive approach" - a large audience of mainly urban youth and foreigners (Taranto & Padulosi 2009, p.33).

After outlining the main features of Bolivia's gastronomic boom, it is easier to understand why agrobiodiversity fairs held in Aymara villages were well-attended events, in which representatives of ACB and private companies were welcome. The presence of and interaction with NGOs, scientists and chefs encouraged farmers to be providers of not only raw ingredients, but also food that they could use for their own consumption, or otherwise commercialise. As explained above, the emergence of urban consumers (Hyman et al. 2000) - increasingly interested in their goods - made small-scale business opportunities increasingly available in the the *desakota* region surrounding La Paz and El Alto.

Picture 7.6: Part of the gastronomic offer of indigenous farmers - a section of the category "traditional foods" in the agrobiodiversity fair of Coromata[104]

Coromata, 05-09-2013.

[104] A more appropriate name for this category would probably be "foods that use native ingredients". In fact, not all foods are prepared according to traditional recipes. On the contrary, as the picture shows, besides foods that have been consumed for centuries by Aymara farmers (like kispiña, with cheese in the upper right corner), "new" foods are also included (i.e. quinoa bread, quinoa doughnuts, quinoa stew, quinoa *tawas*, quinoa *humintas*, cañahua cakes, etc.).

Lastly, I should point out that the Bolivian government was a crucial influencer of the gastronomic transition's features. As already clarified, public institutions and research centres were actively involved in numerous initiatives aiming at redeeming and revalorising indigenous crops, while promoting agrobiodiversity. Moreover, the process of agrobiodiversity "reinvention" happened within an institutional framework that, besides being overall favourable for private stakeholders, also fostered a political and legal approach that did not delink native crops from indigenous peoples' lifestyle and identities (5.7.1). The particular attention granted to indigenous small-scale farmers, the recognition to their role as custodians, and the political, ethnic and food-sovereignty-inspired consideration for their wellbeing in the culinary boom discourse, were elements marking in Bolivia the distinct link between the transformation of urban consumption preferences and agrobiodiversity "reinvention".

Cholo-mestizo buyers: a viable future for agrobiodiversity reinvention?

As I have just explained, in Bolivia - like in Peru - the main characters of the gastronomic boom are chefs and upper-class consumers - to a large extent the 'pilots' of this transition - together with civil society organisations. The latter aim at benefitting small-scale producers. It could be argued, however, that misrepresentation and dependency are possible side effects of their work.

Most of the instances of "indigenous modernities" - leading to a "reinvention" of agrobiodiversity - outlined so far are the result of NGOs' and scientists' initiative. Farmers, however, should not be perceived as victims of an imbalanced relation, because, as illustrated:

1. NGOs and scientists often support smallholders efficiently with the establishment of partnerships that will survive the interruption of their field activities;
2. Producers associations are created for farmers to gain long-term self-sufficiency and credibility towards potential buyers;
3. Trainings are held for farmers to acquire the skills and awareness that are necessary for the conservation and the commercialisation of agricultural varieties and locally prepared food;
4. Aymara people materially benefit from the newly available opportunities that they spontaneously decide to take advantage of, exercising their agency and making selective choices.

In addition, indigenous small-scale producers also conclude business deals independently through a strategic use of *desakota* networks. Agreements do not only involve or target urban companies and buyers that have remoulded their preferences and tastes within the framework of the on-going gastronomic shift; they also aim at a different kind of partners and customers, revolving around the *cholo-mestizo* world.

Due to the "increasingly blurred distinction" (Zhu et al. 2009, p.215) and the mutual influences between countryside and city, in parallel to an *in situ* urbanisation of rural communities, also a "'ruralisation' of tastes and consumption patterns in the fast growing cities" is possible (Pinedo-Vasquez & Padoch 2009, p.93). In the Altiplano Norte the "ruralisation" of eating habits touches both La Paz and El Alto, where migrants have settled. It makes typically rural consumption behaviours emerge alongside urban ones in the frame of the *cholo* lifestyle and identity (4.5).

With reference to Peru, Ypeij speaks of a process of overall *cholificación* ("cholification") taking place in Lima, with an increasing overlap between the urban, the *andino*, and the globalised. A fusion of these three souls, she argues, is in place especially amongst youth (Ypeij 2013) and is applicable to food choices. In Bolivia, I observed a similar process. To explain it further and reassure the reader about the similarity of the two countries in this particular respect, I will use the same example through which Ypeij discusses the concept of "*fusión*" in Peru - soft drinks. The product Inca Kola ("Sabor de Peru") is an extremely popular beverage for Peruvians. In 2012 this brand launched an advertising campaign with the title "*Fusionista, fusionar y mezclar cosas diferentes creando la nueva*" - "*Fusionista*, blending and mixing different things to create a new one") that plays with the tendency of Peruvians to "*fusionar todo*" ("blend everything") thanks to their creativity (Ypeij 2013). The parallel with a similar instance in Bolivia is straightforward. On the other side of the Titicaca one of the most consumed fizzy drinks is Coca Quina, produced by the brand La Cascada (that goes by the slogan "*Orgullosamente Boliviana*" - "Proudly Bolivian"), and prepared with locally sourced ingredients to create a drink that combines and exalts both global and Bolivian.

Narrowing the analysis down to agrobiodiversity conservation and the use of Andean grains, the consumption of *kispiña* in El Alto provides a good example of "ruralisation" within the framework of "cholification". *Kispiña* was sold only occasionally and in limited quantities in the Altiplano Norte urban markets. Due to their rural origins, most inhabitants of El Alto and of the *cholo-mestizo* districts of La Paz relied on a direct supply of this and other rural products (i.e.

chuño or *tunta*) from their families and friends in the communities (4.4; 4.5; 6.3.3). During my visits to urban markets, I noticed that indigenous foods like *kispiña* - characterised by a shorter preservation period than freeze-dried products - were sometimes there, but were not widely available (Fieldnotes 21-11-2012). However, the progressive commodification of crops and foods produced by Aymara people and the growing demand for these goods amongst recent urban dwellers would be effective incentives for an increased commercialisation of *kispiña*, considered a typical *comida del campo*. I learnt by interacting with PROINPA scientists in their La Paz office that this organisation had already identified a possible gap to be filled by APROCA and ADAMA farmers and wished to support the development of a structured *kispiña* business. "People from rural areas love *kispiña*. It tastes good and it is very nutritious. Migrants from the countryside who live in the city miss *kispiña* a lot because it is impossible to find it in urban markets. So, when those from *el campo* bring it, they are very happy to eat it. To boost the conservation of quinoa varieties in the Altiplano, it would be a good idea to promote the sale of *kispiña* in the city, as a hygienically safe and packaged product" - told me a PROINPA agronomist (Interview 21-08-2012). At the time of my fieldwork, this had not yet been discussed with farmers and turned into practice. However, a few of them sold *kispiña* autonomously - individually through intermediaries, or collectively as an association within broader business agreements. The growing demand for this food, particularly in El Alto, was their predominant motivation factor (Unstructured interviews 14-10-2012).

The connections that farmers established with buyers in El Alto were, according to my analysis, those that had the best chances to be independently maintained by associations like APROCA and ADAMA in the future, without any support from NGOs and scientists. In 2012 PROINPA proposed to the farmers of Cachilaya a business partnership with a restaurant of El Alto, interested in buying *chuño*, *tunta*, quinoa and *kispiña* from this community. The restaurant's demand for these products promised to be relatively irregular, because the requested frequency and quantities depended on the patrons' unpredictable choices. However, farmers enthusiastically concluded the deal. They could easily communicate and negotiate with the owner, an Aymara woman of rural origins, who was a second-generation migrant. Furthermore, the erratic nature of the restaurant's needs matched perfectly with APROCA's impossibility to provide continuous and regular supplies, as well as with the farmers' custom to sell their produce "on the spot". Also in this case, scientists played a crucial role. However, the characteristics of this partnership were such that farmers were positive about its future continuation (Fieldnotes 11-10-2012). It can be concluded that the *cholo-mestizo* market offers

feasible commercial options for indigenous producers, who - because of migration and their frequent trips to the city - are as well part of the same rural-urban world.

8. Conclusions

This study has investigated the connections that exist between agrobiodiversity conservation and farmers' migration in the Altiplano Norte of Bolivia, Lake Titicaca region. It has explored the socio-economic context in which indigenous farmers operate today, in order to analyse - with a specific focus on migration - which elements determine people's choices and behaviours concerning agrobiodiversity conservation and use. Although it is a predominant socio-economic process, the phenomenon of rural-urban mobility with all the consequences it entails (i.e. depopulation of rural communities; *in situ* urbanisation of the countryside; a shift in customs and mentality amongst indigenous farmers, generating a new relationship between them and their crops and livelihoods) has been hardly considered so far with reference to on-farm agrobiodiversity conservation. It is important to understand how these two elements are connected with each other. Smallholders do not only relate to agrobiodiversity according to traditional practices. They also respond to social, economic and agronomic processes unfolding within and beyond their communities. These are particularly the increased proximity and intensified interaction between countryside and city. Farmers' decisions concerning agrobiodiversity portfolios are shaped by new stimuli and priorities, generated by this context in transformation.

This thesis has identified and discussed two trends composed of mechanisms linking agrobiodiversity conservation with migration - one of agronomic simplification and one of so-called agrobiodiversity "reinvention". While a large portion of the data collected in the Altiplano Norte in 2012-2013 showed that agrobiodiversity conservation and use are threatened by deagrarianisation and depopulation in rural communities, evidence that demonstrates the existence of a new interest towards agrobiodiversity, generating novel uses of it in indigenous villages, was also found.

In this last chapter I firstly retrace briefly the rationale of this work. Secondly, I include some concluding remarks on the theoretical and methodological approaches that I adopted. Then, I summarise the main findings of this study with reference to the mechanisms of connection I identified, by pulling together the arguments and evidence that provide a response to the central research question "*What are the connections between indigenous farmers' rural-urban migration and agrobiodiversity conservation in the Altiplano Norte of Bolivia?*". I consider it outside the scope of this piece of research to identify specific avenues for the reform of

agrobiodiversity-related policy or practice. At the end of this thesis I outline the main "take-home messages" of this work. These refer mainly to the approach that emerges as effective for a comprehensive study of agrobiodiversity conservation in the contemporary Altiplano Norte and in similar scenarios. It is thanks to it that my research could identify some currently crucial allies for scientists and successful practices in a context of rural-urban migration. Future efforts and activities should incorporate this approach to ensure a more realistic and effective planning and long-lasting results. Finally, I offer some suggestions for future research. I identify and outline two issues that - although marginally explored in this thesis - my research brings to light. I suggest that they are closely looked at in dedicated studies.

Reiterating the justification for this research

Agrobiodiversity conservation, particularly on-farm conservation, has recently gained global attention. Scientists and policymakers acknowledge its importance in tackling climate change and enhancing food security - especially in the Global South. At the same time, the activities carried out by small-scale farmers for their own subsistence are recognised as crucial for the preservation of seed varieties and, more generally, agro-ecosystems. In the Lake Titicaca region - where this research has focused - numerous initiatives have been launched in the last decades by national and international stakeholders with the aim of preventing a loss of agrobiodiversity, a tangible possibility in a changing rural world (chapters 1 and 2).

For centuries indigenous farmers have conserved a broad range of agricultural varieties in their plots, together with relevant knowledge. At present, however, while many of them continue to rely on a large diversity, people in rural communities are increasingly oriented towards the city, embedded, because of migration, in networks and dynamics that span the rural and urban dimensions. Youth, in particular, often leave their rural villages and settle elsewhere - temporarily or permanently - in search of monetary gain and better living conditions (chapter 4).

The social and economic transformations taking place in this region, within and beyond indigenous villages, cannot be ignored when studying agrobiodiversity conservation and use. Aymara farmers from the Lake Titicaca increasingly gravitate towards La Paz and El Alto; the boundaries between countryside and city are more and more difficult to define; spaces and identities that straddle the rural and the urban emerge. Agriculture in general - and agrobiodiversity conservation in particular - change together with producers' families and communities. Practices and choices are reshaped according to smallholders' perception of them, and to the value they associate with different crop varieties and uses (chapter 5). This

threatens the continuation of agrobiodiversity conservation, but also generates new stimuli for its perpetuation and revival.

This research stemmed from the identification of a gap in the literature. A review of published material about on-farm agrobiodiversity conservation revealed that farmers' mobility is not taken into any explicit account in connection with this practice. With specific reference to the Altiplano Norte, it emerged that studies on agrobiodiversity conservation mostly keep a narrow focus on rural households and communities. Farmers, as a result, are analytically detached from the broader rural-urban processes that they are - in reality - deeply entangled in.

With the aim of producing new knowledge that can contribute to the future elaboration of more effective agrobiodiversity conservation strategies targeting indigenous smallholders, this work has explored the ways in which rural-urban migration and on-farm agrobiodiversity conservation and use are inter-connected. It has looked at some widespread phenomena that Altiplano Norte farmers are influenced by and are part of, to uncover the multi-directional linkages that put these two elements in relation with each other. This thesis has analysed - through the lens of migration - the complex configuration in which indigenous farmers, who conserve agrobiodiversity, are currently situated.

Remarks on theory and methodology

While some of the literature concerning out-migration from developing countries' rural areas considers this phenomenon as part of an inevitable uni-directional shift from rural to urban, from indigenous/traditional to non-indigenous/modern, from subsistence farming to urban-based livelihoods, such a reading is limiting when it comes to the study of agrobiodiversity conservation, particularly in a context like the Altiplano Norte. Here these definitions and categories often overlap, and multiple and multi-directional connections emerge when agrobiodiversity conservation is looked at in its connection with migration.

Although it is undeniable that, along the path towards a country's development, deagrarianisation and urbanisation are normally observed, with an overall decrease in crop diversity, and - quite often - an abandonment of farming altogether, it is important to allow enough analytical space for the different and, to a certain extent, opposite dynamics, that take shape within the same framework. Therefore, rather than restricting my analysis to assessing the existence of connections that foster an agronomic simplification trend (3.2.3; chapter 6), I have used this research to identify and explore also those mechanisms that generate a process

of reinvention, re-evaluation and revival of crop varieties' maintenance and utilisation (3.2.4; chapter 7). Such dynamics are in place in the Lake Titicaca region, particularly in association with the novel habits and identities - merging indigenous values and customs with an entrepreneurial logic - that are becoming established in both rural and urban spaces following migration. They often are the result of scientists' activity and of the penetration in farmers' villages of a rhetoric - promoted by the Bolivian government and international organisations - that celebrates indigenous crops and food. Their identification and analysis has required the elaboration of a theoretical and methodological framework that was appropriate to investigating the complexity and multi-directionality that characterise the study of agrobiodiversity/migration linkages in the research area.

This work has firstly taken a critical stance towards those approaches that apply a uni-linear view to the connection between migration and agriculture - i.e. those based on the assumption that an inevitable abandonment of farming takes place in developing countries, or that a direct link between development and agrobiodiversity loss exists (Bernstein 2010a; Bryceson 1997; Pascual et al. 2011; Winters et al. 2006; Bryceson et al. 2000).
Secondly, it has engaged with the livelihood diversification and deagrarianisation debates (Rigg 2006; Rigg et al. 2008; Kay 2008), on one side, but it has also relied, on the other side, on the "repeasantization" argument, and on a perspective that emphasises farmers' agency in their dialogue and negotiation with structural dynamics (Van Der Ploeg 2008; Robins 2003; Bebbington 1993; Bakewell et al. 2012). Concepts like "new rurality", *desakota*, and *in situ* urbanisation (De Grammont 2008; Pérez et al. 2008; McGee 2009; McGee 1991; Zhu 2004; Zhu et al. 2009; Kay 2008) were used to articulate the notion of migration - making it suitable for researching the Altiplano Norte context - and to theoretically encapsulate both trends (agronomic simplification and agrobiodiversity "reinvention") within its composite scenario (3.2).

The question at the centre of this work was operationalized by developing some research hypotheses in the form of mechanisms, linking agrobiodiversity conservation and indigenous peoples' migration (3.3). Two strands of connections took shape from a thorough engagement with the literature, which the collection and the analysis of primary data were based upon. The evidence gathered in Bolivia confirmed the existence of these broad categories. However, the specific lists of mechanisms, identified through secondary information with reference to each one, were readjusted - over the course of the fieldwork - based on the empirical observations

that uncovered agrobiodiversity-migration connections not taken into due account at the outset.

The existing mechanisms were discussed in this thesis with regard to the processes of agronomic simplification and agrobiodiversity "reinvention". It is important to underline that neither of the two relies on a neat analytical separation between the rural and the urban spaces, or on a predominance of one dimension above the other. On the contrary, they both derive from the encounter and the overlap of "rural-ness" and "urban-ness" that characterise today's Altiplano Norte *desakota* region, and make the study of the effects of migration relevant to an otherwise typically rural practice like on-farm agrobiodiversity conservation. Without over-simplifying an extremely complex reality (the acknowledgement of the research context's complexity being a basis for this study), leading each mechanism back to one of these two trends has facilitated the analysis of the multiple and multi-directional connections between agrobiodiversity conservation and indigenous farmers' migration. The two categories have never been considered as fixed or closed, as they both emerge from the same heterogeneous reality.

The contribution of this research

This work has shed light on the connections between agrobiodiversity conservation and farmers' out-migration from rural communities in the Altiplano Norte. It has, therefore, fulfilled its scientific objective. Its central finding is the verification of the existence - in the research area - of the two broad processes discussed above. In this section I summarise the specific mechanisms that each of them includes, because together they provide a response to the question at the centre of this research. I firstly retrace those leading to agronomic simplification; then, I move on to those responsible for agrobiodiversity reinvention.

<u>Agronomic simplification</u>

I have documented this process by looking at depopulation, on one hand (6.3), and *in situ* urbanisation, on the other hand (6.4).

- Depopulation

The physical absence of people in rural communities is detrimental for agrobiodiversity conservation-related work. Many in the Altiplano Norte pull out of farming. Deagrarianisation

takes place. The migrants who choose far-away destinations within Bolivia (i.e. Santa Cruz) or abroad (i.e. Argentina, Brazil) show a propensity to detach themselves completely from their places of origin and from agricultural livelihoods. Those who move internally to closer destinations - i.e. to La Paz or El Alto - maintain more assiduous connections with their family, land and crops, although their relationship with them changes deeply after migration (6.3.1).

Residentes attribute little importance to farming, as opposed to their urban livelihoods, which give them economic gain and stability. They relate to it with a utilitarian attitude, which relegates agrobiodiversity conservation to the status of an unnecessary extra. High yields and the absence of pests from cultivations are valued more than the possibility to distribute agronomic risk or diversify diets.

Furthermore, the continuation of traditional practices connected with agrobiodiversity conservation is challenged by migration. Firstly, the effectiveness of inter-generational channels of seed and knowledge transmission is jeopardised. Migrants who still participate in sowing and harvesting activities rely on their elderly relatives' expertise in decision-making concerning the choice of seeds. They do not teach their children - born and raised in the city and uninterested in agriculture - what they know about agrobiodiversity conservation and farming more generally, marking a fracture in the vertical transfer of notions and skills.

Secondly, intra-generational channels of seed and knowledge transmission are affected. Permanent migrants are absent in some crucial moments of the crop year (i.e. seed selection or product transformation). In addition, they do not take part in the initiatives proposed by scientists, like agrobiodiversity fairs, or the setting up and management of community seed banks (6.3.3).

Scientists' activities targeting on-farm agrobiodiversity conservation are undermined by the departure of numerous families and by the lack of young people. Resources are gradually shifted away from rural villages as a consequence of depopulation. Empty communities attract little public and private investment (6.3.2).

- *In situ* urbanisation

In their urbanising rural life indigenous farmers increasingly make simplifying choices. Firstly, in a "new rurality", the main reason to maintain a broad diversity portfolio disappears due to livelihood diversification. When farming is an accessory activity, performed alongside other income-generating ones, alternative risk management strategies are adopted instead of agrobiodiversity conservation (6.4.1).

Secondly, farmers tend to focus their production on a narrow range of "modern" varieties. The external introduction of new seed varieties is not *per se* negative for agrobiodiversity, as it does not necessarily entail replacement, but - quite often - integration. However, farmers' tendency to prioritise productivity to the detriment of diversity is accentuated by their constant contact with *residentes*, the market, and the urban world (6.4.3).

Thirdly, a new perception of agriculture - with a push towards modernisation and the affirmation of an income generation-oriented mentality - undermines farmers' trust in traditional knowledge concerning crop production. Young people, in particular, increasingly rely on the knowledge transmitted to them by scientists or formal education. Second generation migrants do not speak Aymara, crucial for the use of traditional channels of seed and knowledge tranfer in rural communities (6.4.5).

Youth do not see their future as necessarily linked with farming. They are attracted by employment opportunities outside their communities, and, even within their village, they often take up non-agricultural activities to increase their income. They do not handle much knowledge about agrobiodiversity and are not interested in acquiring it (6.4.2).

Residentes cause fragmentation in Aymara villages, as collective processes and practices must come to terms with multi-locational households spread across rural and urban areas. This has negative effects on agrobiodiversity conservation, which relies on a collective effort and a distribution of roles and responsibilities according to a shared custodianship at both the family and the community level. *Residentes*' participation in community meetings and in the day-to-day routine of indigenous villages is irregular and often self-serving. Agrobiodiversity conservation is relegated to the private sphere, while community leaders promote modernising initiatives (6.4.4).

In conclusion, the income-and-consumption-oriented mentality, typical of rural migrants in urban areas, influences aspirations and priorities in indigenous communities even when people do not move from there. Farmers' livelihoods, choices and lifestyle change according to a *cholo-mestizo* logic. On one hand, new priorities and an intense mobility of people within the Altiplano *desakota* region make the market - central in the *cholo-mestizo* society - gain importance in the routine and the habits of rural people; on the other hand, eating habits increasingly retrace urban tastes and preferences. The market privileges a limited number of agricultural varieties to the detriment of diversity, while locally grown crops lose prominence in meals with the affirmation of purchased food that is processed in the Altiplano or imported from other regions (6.4.6).

Agrobiodiversity reinvention

In the Altiplano Norte agrobiodiversity reinvention can be associated with *in situ* urbanisation (7.2), return migration (7.3), and the gastronomic transformation and ruralisation of tastes taking place in the cities (7.4).

- *In situ* urbanisation

Temporary migrants are often involved in agrobiodiversity reinvention mechanisms. Thanks to their migration experience, they are more self-confident and open to the world outside their village than non-migrant farmers. As compared to permanent migrants, they leave for shorter periods of time, and their participation in agriculture and community life throughout the year is more consistent. Unlike *residentes*, they rely on agriculture as their main livelihood, which they seek to make more efficient and profitable by learning from scientists and using the skills, entrepreneurial mentality and connections they acquired through migration. They are often at the forefront when new initiatives concerning agrobiodiversity conservation are proposed by external actors, and they are particularly willing to seize agrobiodiversity-related opportunities deriving from their interaction with urban-based stakeholders (7.2.1).

In Aymara communities non-migrant farmers perceive migrants as figures of reference, experimenters, and innovators. Within an *in situ* urbanisation framework, social remittances and rural-urban networks contribute to propagating, in migrants' communities of origin, an eagerness to acquire new knowledge; an entrepreneurial mentality that takes shape following the diversification of livelihoods and the frequent connections between countryside and cities; an openness towards external actors and new opportunities. The open-mindedness and curiosity of certain individuals and their role as charismatic leaders in indigenous villages make scientists' work more viable and successful. Without them, externally proposed initiatives (i.e. the recovery and (re)introduction of seeds, or the diversification of crop varieties' uses) would not raise the same interest (7.2.2).

Farmers' openness and eagerness to increase their monetary income and improve their living conditions according to a *cholo-mestizo* lifestyle make them particularly ready to establish commercial partnerships and seize selling opportunities. These assign an economic importance to products normally relied upon for subsistence reasons, and new uses to agricultural varieties, besides traditional ones (i.e. through the preparation of new dishes that use native crops). Farmers become conscious of the value of agrobiodiversity and the consideration that numerous stakeholders (i.e. scientists, chefs, tourists, retailers) have for it mainly through their

collaboration with scientists, in a moment in Bolivia's history in which native crops and indigenous diets are at the centre of a revival (7.2.3).

Agrobiodiversity fairs have become part of community life in several Altiplano villages. Their implementation depends largely on the support of external stakeholders (i.e. scientists and NGOs). However, these festivals encourage seed and knowledge exchange within and amongst indigenous communities. Farmers' communities incorporate or reject externally introduced initiatives like this one based on their convenience, needs, and interests. Their choices are strongly shaped by *in situ* urbanisation (7.2.4).

- Return migration

In one of the fieldwork sites I could observe a special connection between agrobiodiversity reinvention and return migration. In Okola a group of farmers offers homestays to tourists in the framework of an agro-tourism project that strongly emphasises agrobiodiversity as one of the community's main characteristics. Tourists can come into contact with agrobiodiversity, learn about farmers' livelihoods, and eat meals cooked for them by their hosts by using native ingredients. Because of their entrepreneurial attitude and open mentality, return migrants were the first community members who got involved in this initiative, which they viewed as potentially profitable and rewarding. Since the launching of agro-tourism, agrobiodiversity has acquired a new value in the eyes of Okola farmers, although there are indeed several challenges embedded in its implementation (7.3.1). Okola's case is unique in the Altiplano Norte. However, it is significant as it highlights a particular link between migration and agrobiodiversity conservation. It represents a best practice (as scientists see it) because agro-tourism successfully reconciles agrobiodiversity conservation and use with farmers' new aspirations - taking shape in an *in situ* urbanisation scenario.

- New tastes and food consumption habits in urban areas

In a moment of rediscovery of Bolivia's indigenous roots, a favourable rhetoric has emerged in the country around native crops. With the blessing of international organisations, the current political leadership has promoted a revival of the Altiplano's products and traditional diet. Within the current institutional and socio-economic scenario a gastronomic revolution is taking place. Similarly to what has happened in Peru on a bigger scale - wealthy white and *mestizo* people from the upper class of La Paz appreciate today indigenous crops and dishes - once considered the food of the poor, but now revalorised by chefs through sophisticated recipes.

The success of events like agrobiodiversity fairs and of commercial partnerships between farmers and urban buyers, now possible and desirable, can be explained by including them in this framework.

In parallel to this, new consumption demands are taking shape amongst recent urban dwellers in certain areas of La Paz and in El Alto. If, on one hand, *cholo-mestizo* people privilege foods and habits that are typical of the richer and more globalised social groups (i.e. with a consumption of great quantities of meat and alcoholic beverages and an attraction towards fast foods), on the other hand, their eating preferences create a market for the food that comes from *el campo*, which they still enjoy eating. Migrants' networks and farmers' positive predisposition play a crucial role in the provision of these rural products to urban buyers.

Both processes raise critical issues (cultural and political ventriloquism and market dependency), as discussed in 7.4. However, it is undeniable that together they contribute to the creation of a setting that fosters agrobiodiversity "reinvention" in consumption - merging new and old needs, interests and habits.

Discussion of the findings

After outlining the agrobiodiversity/migration connections that this research has uncovered and explored, I would like to bring attention to some aspects that emerge from the analysis presented in this thesis. This serves the purpose of drawing conclusions that allow the reader to understand the relative strengths and weaknesses of the two trends discussed above.

Firstly, it is important to notice that most agrobiodiversity "reinvention" mechanisms entail, in a way or another, an involvement of scientists. The presence in indigenous communities of NGOs and agronomists promoting agrobiodiversity conservation is crucial in the "reinvention" process. This shows that, in the face of a spontaneous tendency towards agronomic simplification and a decline of farming as a consequence of migration and livelihood diversification, deliberate and planned efforts - hinging upon a favourable discourse and a renewed interest in native crops - encourage a revival of agrobiodiversity. It is also indicative of the respective weight of the two trends in the Altiplano Norte. Agronomic simplification and agrobiodiversity "reinvention", however, exist within the same rural-urban situation, and are not easily quantifiable. Therefore, in this thesis I have analysed them as parallel and simultaneous processes, whose longer-term outcomes are uncertain. What can be said, though, is that scientists' work is based on the acknowledgement that agrobiodiversity loss is a concrete possibility in the Altiplano Norte "new rurality". This is why their mission is to

increase farmers' awareness of the intrinsic value of agrobiodiversity, and implement incentivising measures for on-farm conservation.

It would be wrong to infer from this that agrobiodiversity "reinvention" relies exclusively on scientists' actions. As I have shown, important socio-economic and political transformations taking place in Bolivia today create a favourable setting for this process. A discourse celebrating indigenous crops and dishes, as well as agrobiodiversity - an important heritage for the country - has emerged. In addition, new identities and lifestyles have developed with rural-urban migration. These influence farmers' choices with regard to agrobiodiversity through *in situ* urbanisation and people's mobility.

Indeed it is mostly through scientists' intermediation that farmers learn about the economic gains and social prestige they can obtain by conserving and using agrobiodiversity. Because of them they come into contact with public and private institutions, researchers, chefs, elite buyers, and tourists that in different ways motivate their conservation efforts. However, the degree and the nature of farmers' openness towards the world outside their village, and their willingness to seize new opportunities derive from the penetration of an entrepreneurial mentality into the countryside and the increased accessibility of potential partners within the Altiplano *desakota* space. "Indigenous modernities" appear according to needs and priorities that are in line with a *cholo-mestizo* mentality, taking over rural communities due to rural-urban proximity.

The market plays an important role in determining both agronomic simplification and agrobiodiversity "reinvention". On one hand, it is responsible for a pressure towards uniformity based on demand; on the other hand, it creates important incentives for farmers who conserve agrobiodiversity, by offering them prospects of income generation linked with crop sale and use. In the framework of agrobiodiversity "reinvention", the gastronomic revolution occurring in Bolivia presents farmers with a series of opportunities, compensating them for their conservation work with monetary earnings. However, farmers at present are not totally self-sufficient in their interaction with chefs and elite buyers and need scientists' help. The setting, instead, which farmers have easy access to without external support, is the *cholo-mestizo* market. This is a controversial ground where opposite trends towards an agrobiodiversity revival, on one side, and agronomic simplification, on the other side, can be observed. As discussed in this thesis, in rural towns, in El Alto and in certain areas of La Paz that register a high concentration of urban dwellers with indigenous origins, *cholo-mestizo* people are strongly attached to their indigenous roots but, at the same time, experience a pull towards a consumerist lifestyle, pursued through an entrepreneurial mentality and successful

businesses. They associate agrobiodiversity with their rural past. They consider it positively, but move it to the background as compared to the comforts of their new life. While they happily buy and consume products from the countryside when these are available in markets, in their daily routine they often adopt food habits regarded as more apt to their urban condition. It goes beyond the task that I committed to complete by conducting this study (i.e. to identify and develop a response to the question at the basis of this research through the use of original data) to predict the future scenario of agrobiodiversity in a context of migration. However, based on my findings, I can argue that the *cholo-mestizo* world seems to be the physical and virtual space where the "reinvention" process currently underway will have to demonstrate its capability to continue in the long run, thanks to farmers' initiative rather than to scientists' work. Its potential as a place where agrobiodiversity "reinvention" can spread through the sale of crops and food should encourage scientists to redirect there their efforts, which, so far, have mostly focused on the creation of commercial partnerships between farmers and chefs or elite retailers. Farmers should be assisted in the development of agrobiodiversity-based business relations with *cholo-mestizo* partners, whom they could interact with easily and independently in the future.

I explained in chapter 1 that, although my work aimed to highlight the connections between on-farm agrobiodiversity conservation and rural-urban migration with reference to the Lake Titicaca region, it also intended to analyse some dynamics that - while disregarded by scientists so far - might be relevant to other parts of the developing world. The elements isolated and discussed above are specific to the Altiplano Norte region and to Bolivia, whose social, economic and political situation is currently experiencing a particular transformation. From an analytical point of view, however, the dynamics I have just retraced could as well be observed in other geographical areas, where - like in the Altiplano Norte - rural-urban relations are changing rapidly, determining a new attitude of farmers towards agrobiodiversity. Furthermore, besides the empirical findings, also the theoretical and methodological frameworks adopted in this thesis can generate useful insights for researchers who look at similar issues in other countries.

My research contributes to the affirmation of an "integrative approach" (also applied by Zimmerer - 2014) for the study and the promotion of agrobiodiversity conservation. I am convinced that the scope of agrobiodiversity conservation strategies should be adjusted across the board in favour of a more open focus that takes the broader context in which farmers live into greater consideration.

The projects implemented in the Altiplano Norte are largely shaped by national and international donors' guidelines. As I could observe, local fieldworkers generally adapt these to farmers' specific needs, interests and requests. Therefore, single operations and activities - thanks to their expertise and skill - often pay due attention to the particular rural-urban relationship characterising the Northern Highlands' today, by factoring in its features and manifestations. However, the same cannot be said for the frameworks that are designed by research and development agencies. These still apply a narrow perspective that largely disregards the socio-economic dynamics influencing farmers' lifestyle and decisions. Their limitations are a consequence of agrobiodiversity literature's failure to analyse aspects like migration in connection with farmers' practices and choices.

This thesis has brought to light relevant linkages exactly with the intention to facilitate the fine-tuning of conservation strategies, based on a deeper understanding of the complexity of the situation in which farmers operate. Zimmerer (2014) concludes his study on maize agrobiodiversity in the Cochabamba tropical mountains by saying that the "results of migration analysis lead to insights for agrobiodiversity management and policy options", and that "the options related to migration must recognise significant agrobiodiversity peri-urbanization and interactions with nonlocal, nontraditional, and migration factors providing noteworthy opportunities". Similarly, I argue that the agrobiodiversity-migration connections I uncovered are useful to elaborate new incentivising measures including "entrepreneurship-based options", and to make the strategies currently in use more viable and incisive. *Desakota* realities are now integral to farmers' way of living. Acknowledging this is crucial to assess the present and future effectiveness of activities and policies; to target the people who will bring new initiatives forward most successfully; and to understand which interests drive farmers' choices. In my research it allowed me to identify those that Zimmerer calls "nontraditional livelihood activities" (according to my findings, in the Altiplano Norte these are agro-tourism; the sale of new agrobiodiversity-based foods to rural and urban buyers; agrobiodiversity fairs) and "emerging livelihood groups" (like temporary and return migrants) that play a role in agrobiodiversity conservation in a rural-urban context.

Recommendations for future research

Finally, there are aspects that I have not explored fully in this thesis, because they fell beyond its scope. However, they have emerged from this research as important questions that deserve to be studied. In fact, they could contribute to understanding more in depth the relationship

between smallholder farmers and agrobiodiversity in a rapidly changing socio-economic setting, enhancing scientists' interventions .

Firstly, it is advisable that the long-term consequences of market-based mechanisms - promoted by scientists as incentives for the conservation of agrobiodiversity in the Lake Titicaca region - are investigated in detail. I have not expanded on the pros and cons of PACS (Payment for Agrobiodiversity Conservation Services) mechanisms, recently introduced but only partly implemented in the research area in an explicit and structured way (i.e. in the framework of conservation and development projects). It emerged from my research that the relationship between agrobiodiversity-conserving farmers and the market is not uni-linear, consistent with the complex and heterogeneous spaces and identities that have emerged in both the city and the countryside by effect of migration and *in situ* urbanisation. How is farmers' participation in the market bound to be like in the future? And how will agrobiodiversity be positioned within it? At the moment it cannot be said that an actual process of commodification of agrobiodiversity is in place in the Altiplano Norte as part of "reinvention". This is due to the small scale of market-based strategies, and the still limited commercial value that agrobiodiversity has. However, farmers' discovery of the economic benefits that they can draw from its use is turning into an important factor at the basis of their motivation to maintain it. In light of this, it is sensible to study how farmers' view of agrobiodiversity and their use of it change in this framework, assessing their long-term sustainability and their consequences on farmers' self-sufficiency and wellbeing. It would be particularly interesting to investigate these aspects with specific reference to the Altiplano Norte.

Secondly, research should be conducted to discover effective ways of making farmers aware of the nutritional value and contribution to their diet of different crop varieties. Scientists and NGOs have so far carried out a noteworthy job regarding the diversification of the uses of agricultural varieties in eating. In line with global strategies and local projects' guidelines, a focus on nutrition has normally been part of their interventions so far. NGOs' staff have worked for the dissemination of relevant knowledge amongst indigenous smallholders through workshops and practical exercises. Nevertheless, my research has highlighted that the penetration and consolidation of this knowledge has been so far extremely slow, let alone its transposition into practice in farmers' families' daily life. In order to make scientists' efforts more incisive and their effects long-lasting, it is necessary to examine the efficacy of current strategies and to elaborate plans that take into account the transformations occurring in the broader socio-economic environment in which farmers live (in urban areas, and across rural and urban areas).

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ANNEX 1: On-farm agrobiodiversity conserved in Coromata Media

AGRICULTURAL VARIETIES CONSERVED ON FARM BY SPECIES																													
N.		Farmer 1	Farmer 2	Farmer 3	Farmer 4	Farmer 5	Farmer 6	Farmer 7	Farmer 8	Farmer 9	Farmer 10	Farmer 11	Farmer 12	Farmer 13	Farmer 14	Farmer 15	Farmer 16	Farmer 17	Farmer 18	Farmer 19	Farmer 20	Farmer 21	Farmer 22	Farmer 23	Farmer 24	Farmer 25	Farmer 26	Farmer 27	Farmer 28	**Total**
Papa varieties																													
1	Amajayu	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
2	Araqueña	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3	Argentina	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4	Azul Kaisalla	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5	Casa blanca	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	Chaly imilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	Cheje ajahuiri	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	3
8	Cheje khati choque	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	3
9	Cheje pitikilla	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
10	Cheje tarako	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2
11	Ch'iyara alca imilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
12	Ch'iyara imillla	1	1	0	1	1	0	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	0	0	0	1	0	21
13	Ch'iyara isla	1	0	1	0	0	0	0	0	1	1	1	0	1	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	9
14	Ch'iyara khati choque	1	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4
16	Ch'iyara pala	0	0	1	0	0	0	1	1	0	0	1	0	1	0	1	0	0	0	1	0	0	1	1	0	0	0	0	0	9
17	Ch'iyara sani imilla	0	0	0	0	0	0	1	1	1	1	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0	0	0	0	8
18	Ch'iyara surimana	0	0	1	0	1	1	1	1	1	1	1	1	0	1	0	1	0	0	1	0	0	1	1	0	0	0	0	0	14
19	Ch'iyara nairana	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
20	Ch'iyara ajahuiri	0	0	1	0	0	1	1	1	1	1	1	1	0	1	0	0	1	0	1	0	1	1	0	0	0	0	0	0	13
21	Ch'iyara Ch'iji Surimana	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3

22	Ch'iyara chojo	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
23	Ch'iyara choquepito	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
24	Ch'iyara koyu	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
25	Ch'iyara monda	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
26	Ch'iyara piñola	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	3
27	Ch'iyara pitikilla	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
28	Ch'iyara polo	1	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	7
29	Ch'iyara Tarako	0	0	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	9
30	Choclo	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
31	Choquepito	0	1	1	1	0	0	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	0	0	0	0	0	0	17
32	Chuju	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
33	Chury puya	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
34	Condor Cayo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	2
35	Condor imilla negra	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
36	Copacabana	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
37	Duraznito	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
39	Janq'u imilla	1	0	0	0	0	0	1	1	0	1	1	0	1	0	0	0	1	1	1	0	1	1	0	0	0	0	0	0	11
41	Janq'u pitikilla	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	3
42	Holandesa	1	1	1	0	0	0	1	1	1	1	1	1	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	12
43	Huaycha	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	0	1	25
44	Janq'u surimana	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	1	1	0	0	0	0	0	0	6
45	Janq'u Wisllapaki	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
46	Janq'u Ajahuiri	1	1	1	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8
49	Janq'u kaisalla	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	5
50	Janq'u kuchi jipilla	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
51	Janq'u leke kayo	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
52	Janq'u Lucky	0	1	1	1	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	8
53	Janq'u monda	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
54	Janq'u Pala	0	1	1	0	0	0	0	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	0	0	0	0	0	16
55	Janq'u piñola	0	0	1	0	0	0	0	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6
56	Janq'u polo	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
57	Janq'u sakanpaya	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4
58	Janq'u tarako	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2

59	Janq'u warisaya	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
60	Jispikito	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
62	Kalla imilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
65	Koyu	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
68	Kullo kauni	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
69	Kunurama	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
73	Larama pala	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
75	Lloko	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3
76	Locka	1	0	1	0	0	0	1	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
77	Luna	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
78	Manzana	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	4
79	Negro Sinchu	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
81	Pala ojo azul	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
83	Pepino	0	1	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6
84	Peruanito	1	1	1	1	0	0	0	0	1	1	1	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	11
86	Pinta boca roja	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
90	Pucamayo	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
91	Pureja	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
92	Puyo	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
94	Queta	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
96	Saytu Lucky	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
97	Suri blanca	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
98	Taja Imilla	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
99	Ukamama	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
101	Wila Ajahuiri	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
102	Wila cheje surimana	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
103	Wila imilla	0	1	1	0	0	0	0	1	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	8
104	Wila isla	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
105	Wila Khati choque	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
106	Wila kuchi jipilla	1	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	5
107	Wila kuchi kallo	0	0	1	0	1	0	0	1	1	0	1	0	1	0	0	0	1	0	1	0	0	0	1	0	0	0	0	0	9
108	Wila Leke kallo	0	0	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0	6
110	Wila Lucky	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	2

111	Wila Muruyu	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
112	Wila pala	0	1	1	0	0	0	0	1	1	1	1	0	1	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	10
113	Wila piñola	0	0	0	0	0	0	1	1	0	1	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6
114	Wila pitikilla	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	0	0	0	0	20
115	Wila sakanpalla	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
116	Wila surimana	0	1	1	0	1	0	1	0	0	0	1	0	1	1	0	0	1	0	1	1	1	0	0	0	0	0	0	0	11
117	Wila Tarako	0	0	0	0	0	0	0	1	1	1	0	1	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	6
118	Wila Wuarisaya	0	0	1	0	1	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
119	Wisllapaki	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
120	Wislulu	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
121	Yari	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
122	Yurima	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
123	Zapallo	0	1	1	0	0	0	0	1	1	0	1	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	8
	Total	21	19	34	5	9	4	16	35	37	36	31	28	26	13	10	5	14	13	33	12	14	14	9	0	4	1	1	1	**445**

	Cañahua varieties																													
1	Ajar cañahua	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	Ch'iyara	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3	Choque pito	1	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0	0	1	0	0	0	0	0	1	1	0	0	8
4	Choquechilliwa	1	1	1	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	1	0	0	0	0	0	8
5	Cutusuma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	Guinda	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	Illimani (acc.081)	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8	Janko cañahua	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	1	0	5
9	Kullaka (acc.472)	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
10	Mixtura	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
12	Saiwa Rojo	1	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	4
13	Taja chilliwa	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
14	Taja naranja	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
15	Taja rojo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Total	11	1	1	1	0	0	2	0	3	2	1	1	3	1	1	1	0	0	2	1	1	0	2	0	1	1	1	0	**38**

Quinoa varieties																														
1	Cotusuma	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	Janq'u	1	1	0	1	0	0	0	0	1	1	1	1	0	1	1	0	1	0	1	1	1	0	1	0	1	1	0	0	16
3	Madrina	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4	Q'illu	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5	Real	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6	Rosado	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	Total	3	1	1	1	1	0	0	0	3	1	2	2	0	1	1	0	1	0	1	1	1	0	1	0	1	1	0	0	**24**
Papalisa varieties																														
1	Ch'iji Ullucu	0	1	1	0	0	0	1	1	1	0	0	1	1	0	0	0	0	0	1	0	1	1	0	1	1	0	0	0	12
2	Morado	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
3	Pasta	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4	Q'illu Ullucu	1	1	1	1	0	0	1	1	1	1	1	1	1	0	0	0	1	0	1	0	1	1	1	1	0	0	0	0	17
5	Wila Ullucu	0	1	0	0	0	0	1	1	1	0	1	1	1	0	1	0	0	0	0	0	1	0	0	0	1	0	0	0	10
	Total	1	3	2	1	0	0	3	3	3	1	3	3	3	0	1	0	1	0	2	0	4	2	1	2	2	0	0	0	**41**
Isaño varieties																														
1	Ch'iji Isaño	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2	Q'illu Isaño	1	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	8
3	Naranja	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	Wila isaño	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5	Pitikalla	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
6	Zapallo	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	Ch'iyara Nairani Isaño	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0	0	0	0	1	0	1	1	0	0	0	0	0	15
8	J'anko Isaño	1	0	1	0	0	0	1	1	1	1	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	9
	Total	5	1	2	0	0	2	3	2	2	2	2	2	4	1	1	0	1	0	2	1	0	1	1	1	1	0	0	0	**37**
Oca varieties																														
1	Q'ini Aphilla	1	1	1	0	0	0	1	1	1	1	1	1	0	0	1	1	0	0	1	1	1	1	1	1	1	0	0	0	18
2	J'anko Q'ini	0	0	0	0	0	0	0	0	0	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
3	Janq'u Apilla	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	3
4	Kella santi	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	3

5	kellu keni	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	2
6	Kochalla apilla	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7	Luky apilla	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2
8	Phino	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
9	Pitikilla	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
10	Q'illu apilla	0	1	1	0	0	0	1	0	0	1	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	8
11	Q'ini asunta	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3
12	Waka liki	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
13	Warisaya	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
14	Wila aphilla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1
15	Wila Q'uini	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	3
16	Wuari Chuchulli	0	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
	Total	2	2	4	0	0	0	2	1	3	5	5	4	2	2	1	1	2	0	3	2	4	1	1	7	1	2	0	0	**57**
	Broad bean varieties																													
1	Chalequito	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1
2	Cheje Habasa	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
3	Gigante de copacabana	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
4	Jaq'u habasa	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
5	Morado habasa	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
6	Uchuculu	1	0	0	0	0	0	0	1	1	0	1	1	0	0	1	0	1	0	0	0	1	0	0	0	1	0	0	0	9
7	Usnayo	0	0	1	0	0	0	0	1	1	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	0	8
8	Wila habasa	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
	Total	1	0	1	0	0	0	0	2	3	1	2	2	0	4	1	0	2	0	5	0	2	0	0	0	2	0	0	0	**28**
	Green pea varieties																													
1	Ch'ujña Arveja	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
2	J'anko Arveja	0	1	0	0	0	0	0	0	1	1	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	6
	Total	0	1	0	0	0	0	0	0	1	2	1	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	**8**

Oat varieties																														
1	Ch'iyara Avena	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
2	Janq'u Avena	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	3
	Total	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	**4**
Barley varieties																														
1	Tika Janko kala	1	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
2	Ch'iyara kala	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	3
3	Ch'iyara silpini	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	3
4	Janq'u silpini	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	1	0	0	0	1	0	0	7
5	K'ullu kallo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
	Total	4	1	0	0	0	0	0	0	1	0	1	3	0	1	1	0	2	0	0	1	1	0	1	0	1	0	0	**18**
Tarwi varieties																														
1	Tarwi	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
	Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	**1**
	TOTAL	49	29	45	8	10	6	26	43	57	50	48	45	38	23	18	7	23	13	50	19	27	18	16	10	13	7	2	1	**701**

Source: Own elaboration of the data provided by the agronomist Vania Alarcon Vicente in 2012.

ANNEX 2: Research hypotheses prior to fieldwork and planned strategy for empirical data collection

Mechanisms connecting agrobiodiversity conservation and migration	**Data needed**	**Data collection methods**
Mechanisms leading to agronomic simplification, loss of diversity and preference for high-yielding varieties		
Indigenous farmers' propensity towards the conservation of agrobiodiversity		
Temporary/permanent migration > increased exposure to high-yielding varieties > increased interest in high-yielding varieties for major economic gain and minor effort in crop production > substitution of low-yielding varieties with high-yielding varieties > loss of agrobiodiversity	Farming preferences after a household experiences migration: - New species/varieties introduced in fieldwork sites (whether high-yielding species/varieties or diverse Andean crops) - Reasons why new crop varieties are introduced - Use of the introduced species (are they integrated with local low-yielding crops or do they substitute them?) - Place/form in which exposure to new varieties happens (in markets, by networking with urban workers or with other migrants)	Semi-structured interviews with farmers who experienced migration either directly or indirectly
Temporary/permanent migration > loss of native language > loss of traditional knowledge concerning the diversity of crop varieties > ignorance about the uses of native varieties > loss of agrobiodiversity	- Number of people who speak Aymara in fieldwork sites at present - Number of people who used to speak Aymara 20 years ago (1) - Number of (temporary and permanent migrants) who speak Aymara (2) - Use of native language in agrobiodiversity conservation (data on the farmers' knowledge	- Archival research in the municipalities' offices (1) - Archival research in the municipalities' offices and interviews with migrant families (2) - Archival research in NGOs, interviews with scientists and semi-structured interviews with farmers (3)

	of the names of different crop varieties in the native language, native crops' main characteristics and uses) (3)	
Permanent migration > scarce participation in the community life > scarce interest in conserving diversity for cultural identity reasons > loss of agrobiodiversity	- People who participate to community festivals and agrobiodiversity fairs (number, gender, age, whether they are/have been temporary/permanent migrants) - Number of migrants participating to agrobiodiversity fairs or food festivals - Products showcased/sold by migrant farmers (1) - Benefits of participating to agrobiodiversity fairs or food festivals (genetic material/knowledge exchanged, recognition given to conservationist farmers, native crops are showcased) - Reputation of conservationist families in the community (2)	- Archival research in NGOs and interviews with scientists; participant observation (1) - Semi-structured interviews with farmers and participant observation (2)
Imported/non-local products are introduced following migration > farmers lose interest in the conservation of local crops due to a change in their consumption habits or to curiosity for imported foods	Farmers' product preferences before and after migration: - Products consumed by non-migrant families vs. products consumed by migrant families (1) - Products dropped following migration (1 and 2)	- Semi-structured interviews with migrant and non-migrant farmers (collection of data with reference to a specific set of crop varieties to be defined in the field) (1) - Farm histories (with data from families with a direct migration experience) (2)
Shift of resources away from crop biodiversity conservation as a consequence of the changes in income-generating activities		
Migration > diversification of income-producing activities > shift in land, labour and capital away from production of genetically diverse crops > agrobiodiversity loss	Distribution of human and material resources within household before and after migration: - Number of people devoted to agriculture in non-migrant families - Number of people devoted to non-agricultural activities in non-migrant families	Semi-structured interviews with both migrant and non-migrant farmers' families and farm histories (with data from both families with a direct migration experience and non-migrant families)

	- Land that non-migrant families devote to indigenous crop varieties vs. - Number of people devoted to agriculture in families that have experienced (temporary) migration of one or more family members - Number of people devoted to non-agricultural activities in families that have experienced (temporary) migration of one or more family members - Land that migrant families devote to indigenous crop varieties	
Depopulation		
Migration towards urban areas > depopulation > scarcity of labour force > people who remain in the rural communities focus on basic food needs > demise of local crops > loss of agrobiodiversity	Same data as above + Activities performed by stayees before and after one or more members of their family migrate	Semi-structured interviews with both migrant and non-migrant farmers' families and farm histories (with data from both families with a direct migration experience and non-migrant families)
Migration of young people		
Migration of young people > loss of traditional knowledge > scarce knowledge of varieties of native crops and of their different uses > agrobiodiversity is not conserved	- Knowledge concerning agrobiodiversity passed down by the elderly to young generations (knowledge on different crop varieties - indigenous name and characteristics, growing techniques, different uses of crop varieties, cooking properties and recipes with indigenous crops) - Role of traditional knowledge in agrobiodiversity conservation	Semi-structured interviews with farmers, archival research in NGOs (studies on the role of traditional knowledge in agrobiodiversity conservation are available), interviews with scientists and farmers
Farmers' decision making capacity		
Migration > absence of men and youth:	- People who migrate (whether men, women	- Archival research in the municipality

> absence of workforce > agrobiodiversity conservation is not performed > decisions in favour of agrobiodiversity conservation are less frequent/are slower	or youth) - Destination - Period spent in receiving areas (whether temporary/seasonal or permanent migration) - In the case of temporary/seasonal migration: time of the year when migration happens (dry season, wet season, harvest time...) - Jobs/activities performed in urban areas (whether seasonal jobs, agriculture-related activities…) (1) - Role of men, women and youth in decision-making concerning agrobiodiversity at the household level (division of duties within the sending households) and at the community level (2)	offices and in NGOs, semi-structured interviews with farmers (1) - Semi-structured interviews with farmers and participant observation (2)
Remittances		
Migration > remittances > purchase of high-yielding seeds and substitution of native crops with high-value commercial crops > decrease in diversity	- Amount of resources deriving from migration received by farmers' households (1) - Use of remittances by the farmers: whether for agriculture (for the purchase of seeds, tools, land etc.) or for private consumption (for commodities, building/improving houses etc.) - Type of seeds purchased with remittances (2)	- Archival research in the municipalities' offices (1) - Semi-structured interviews with farmers (2)
Proximity to markets		
Migration and migrants' networks > increased integration into the market and lower transaction costs for participation in market activities > increased uniformity of products in response to market forces	- Role of temporary migrants and returnees in shaping participation of farmers in local/regional markets (migrants as mediators/facilitators?) - Relations established by migrants with urban workers or with other migrants (personal relations, business/commercial relations)	Semi-structured interviews with farmers

Mechanisms leading to reproduction and reinvention of agrobiodiversity		
Indigenous peoples' propensity towards the conservation of agrobiodiversity		
Temporary migration > farmers speak both Aymara and Castellano > farmers participate in agrobiodiversity workshops in Castellano organised by local NGOs > farmers learn that conserving agrobiodiversity can be a rewarding business	- Theme of the workshop, organisers (farmers, local/international organisations...) - Participants to the workshops (number of participants, gender, age) - Language in which the meetings are held (whether Castellano or Aymara) - Outcomes of the workshops (new techniques/knowledge introduced, seeds distributed, awareness about agrobiodiversity conservation...)	Interviews with scientists, semi-structured interviews with farmers and participant observation
Temporary migration > indigenous farmers become more open to the external world and to business > farmers increase their presence in the market > they are encouraged to conserve native varieties that they can exchange in markets	- Participation of temporary migrant farmers/families of migrants in local/regional markets - Products exchanged by migrants in local/regional markets/fairs (i.e. seeds of local varieties) - Attitude of the migrants towards agrobiodiversity (perceived as an opportunity for increasing gains/as a source of wealth?) and possible spill-over effects on other community members	Semi-structured interviews with the farmers and participant observation
Knowledge transfer and introduction of new material		
Migration > exchange of seeds/introduction of new germplasm > increase in conserved agrobiodiversity	- Products that migrants/returnees introduce following migration - Products exchanged between migrants of different rural communities that meet in urban areas	Semi-structured interviews with farmers who experienced migration either directly or indirectly and participant observation
Temporary/return migration or rural-urban networks > introduction of new skills and ideas in the community of origin > improved	New ideas and knowledge introduced by the migrants (i.e. agricultural techniques, irrigation practices, storage practices, recipes using Andean	Semi-structured interviews with farmers who experienced migration either directly or indirectly and

agrobiodiversity conservation activities	crop varieties, opportunities to sell indigenous crops and to make earnings out of this business, information about agrobiodiversity fairs in the region, information about intra-community farmers' networks, increased awareness of the importance of conserving agrobiodiversity)	participant observation
Remittances		
Migration > remittances > increased investment in agrobiodiversity conservation	- Amount of resources deriving from migration received by farmers' households (1) - Use of remittances by the farmers: whether for agriculture (for the purchase of seeds, tools, land etc.) or for private consumption (for commodities, building/improving houses etc.) - Type of seeds purchased with remittances (2)	- Archival research in the municipalities' offices (1) - Semi-structured interviews with the farmers (2)

ANNEX 3. Example of data collected for each farmer informant in rural communities

After collecting data in the field, the information about each farmer's family and crops (obtained through survey questionnaires, interviews, focus groups, when applicable, participant observation and visual techniques) was included in spreadsheets. Below is an example of the data I gathered about the family of a farmer from Cachilaya.

Agricultor/a: Rosa, mujer, 59 años.

Familia - información general

Miembro	*Genero*	*Edad*	*Idioma*	*Alfabetización*	*Estudia?*	*Nivel más alto de instrucción*
Padre	m	60	Aymara	Sí	No	Quinto primaria
Madre	f	59	Aymara/Castellano	Poco	No	Participó a un programa de alfabetización
Hijo	m	40	Aymara/Castellano	Sí	No	Bachiller
Hija	f	-	Aymara/Castellano	Sí	No	Bachiller
Hijo	m	-	Aymara/Castellano	Sí	No	Bachiller
Nieto	m	10	Aymara/Castellano	Sí	No	Bachiller
Nieta	f	5	Aymara/Castellano	-	No	Bachiller

Migración

Miembro	*Migró?*	*A dónde?*	*Hace cuánto tiempo?*	*Por qué razón?*	*Cómo ayuda en el hogar?*
Padre	No	-	-	-	-
Madre	No	-	-	-	-
Hijo	Sí	La Paz	20 anos	Trabajo	No ayuda con dinero pero ayuda en siembra y cosecha
Hija	Sí	La Paz	22 anos	Para seguir a su esposo	No ayuda con dinero pero ayuda en siembra y cosecha
Hijo	Sí	La Paz	25 anos	Trabajo	No ayuda con dinero pero ayuda en siembra y cosecha
Nieto	Nació en La Paz	-	10 anos	-	No ayuda
Nieta	Nació en La Paz	-	5 anos	-	No ayuda

Tierra

Superficie total de la familia (hectáreas)	*Superficie para agricultura*	*De la cual en descanso*	*Propiedad*	*Terreno obtenido cómo?*	*Título*
1/2 h	10x100	20x100	Propio	Herencia	Sí

Cultivos

Cultivo	*Superficie sembrada*	*Origen de la semilla*	*Cantidad de semilla*	*Cantidad cosechada*	*Tractor?*	*Vende*
Papa	10x100	Propia	2 kilos	30 quintales	Sí	No
Quinua	10x100	Propia	2 kilos	1 quintal	No	Sí , 10%
Cebada	10x100	Propia	1 arroba	3 quintales	No	No

Variedades agrícolas/superficie sembrada

N.	*Papa*	*Quinua*	*Cebada*
1	Huaycha	Real	
2	Chiyara Imilla	Janqu jhupa	
3	Sani Imilla	Wila jhupa	
4	Yokalla		
5	Pala		
Tot.	30	3	1
Aumentó? (20 años atrás-hoy)	Sí (de 5 a 30)	Sí (de 1 a 3)	No

Transformación de productos

Productos transformados según importancia			
Producto	*Cantidad*	*Cuándo*	*Vende*
Chuño	3 quintales	Una vez al año	No
Tunta	2 quintales	Una vez al año	No
Pito	No sabe	No sabe	No

Venta

Productos más vendidos por la familia				
N.	**Producto**	**Dónde**	**Informaciones sobre el precio**	**Acuerdos con intermediarios/empresas**
1	Queso	Batallas	De los rescatistas/comerciantes	No

Alimentación

Frecuencia (veces por semana)							
Producto	**Frecuencia**						
Papa	x	x	x	x	x	x	x
Zanahoria	x	x	x	x	x	x	x
Cebolla	x	x	x	x	x	x	x
Oca	x	x	x	x	x	x	x
Pan	x	x	x	x	x	x	x
Tunta	x	x	x	x	x	x	x
Chuno	x	x	x	x	x	x	x
Caya	x	x	x	x	x	x	x
Haba	x	x	x	x	x		
Tomate	x	x	x	x			
Lechuga	x	x	x	x			
Quinua	x	x	x	x			
Oca	x	x	x				
Arveja	x	x	x				
Fideo	x	x	x				
Arroz	x	x	x				
Papalisa	x	x					
Galleta	x						
Cebada							
Cañahua							
Avena							

Ferias de agrobiodiversidad

Feria 2013

Papa	48
Oca	11
Haba	10
Ullucu	5
Quinua	5
Cañahua	3
Cebada	3
Arveja	1
TOTAL VARIEDADES	**86**

Feria 2012

Papa	
1	Ch'iji Pala
2	Ch'iyara allka
3	Ch'iyara imilla
4	Ch'iyara isla
5	Ch'iyara pala
6	Ch'iyara sani imilla
7	Chulo
8	Coyu
9	Janq'u imilla
10	Janq'u llokalla ch'iji
11	Janq'u nairani polo
12	Luki
13	Pepino
14	Wila allka pitikilla
15	Wila allka surimana
16	Wila nairani pala
17	Wila Pala
18	Wila pitikilla
19	Wila polo
TOT	**19**
Isaño	
1	Ch'iyara nairani
2	Janq'u isaño
3	Pitikilla
4	Q'illu isaño
TOT	**4**

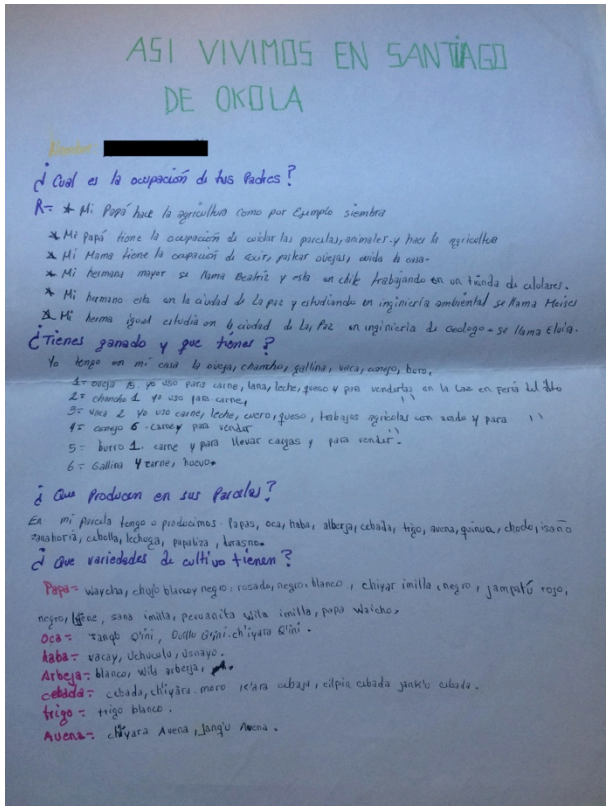
Oca	
1	Janq'u aphilla
2	Janq'u q'ini
3	Kella sunti
4	Q'ellu aphilla
5	Q'ini aphilla
6	Wila aphilla
7	Wila ullucu
TOT	**7**
Ullucu	
1	Ch'iji
2	Q'ellu ullucu
3	Wila ullucu
TOT	**3**
Haba	
1	Janq'u chaleco
2	Janq'u jawasa
3	Morado
4	Q'ellu jawasa
5	Wila jawasa
TOT	**5**
Arveja	
1	Arveja criolla
TOT	**1**

Quinua	
1	Janq'u jupa
2	Negro jupa
3	Q'ellu jupa
4	Wila jupa
TOT	4
Cebada	
1	Chapi cebada
2	Ch'iyara cebada
3	K'ala cebada
Cañahua	
1	Janq'u cañahua
2	Naranjada
TOT	2

TOT
VARIEDADES **45**

ANNEX 4. Example of assignment handed in by a student of Santiago de Okola in the framework of the competition launched by the Irfoss team (*)

Pictures



ASI VIVIMOS EN SANTIAGO DE OKOLA

Nombre: [redacted]

¿Cuál es la ocupación de tus Padres?

R= ★ Mi Papá hace la agricultura como por Ejemplo siembra

★ Mi papá tiene la ocupación de criar las parcelas, animales. y hace la agricultura
★ Mi Mama tiene la ocupación de cocinar, pastar ovejas, cuida la casa.
★ Mi hermana mayor se llama Beatriz y esta en clik trabajando en una tienda de celulares.
★ Mi hermano esta en la ciudad de La paz y estudiando en ingeniería ambiental se llama Moises
★ Mi herma igual estudia en la ciudad de La Paz en ingeniería de geologo - se llama Eloisa.

¿Tienes ganado y que tienes?

Yo tengo en mi casa 6 ovejas, chanchos, gallina, vaca, carnero, burro.

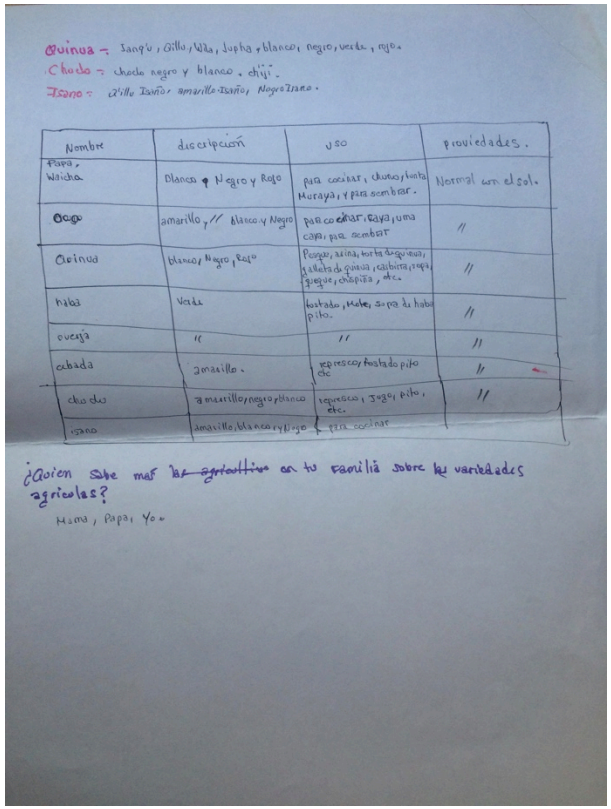
1= oveja 6. yo uso para carne, lana, leche, queso y para vendertas en la Casa en feria del Alto
2= chancho 1 yo uso para carne,
3= vaca 2 yo uso carne, leche, cuero, queso, trabajos agricolas con arado y para
4= carnero 6 carne y para vender
5= burro 1. carne y para llevar cargas y para vender.
6= Gallina 4 carne, huevo.

¿Que Producen en sus Parcelas?

En mi parcela tengo o producimos Papas, oca, haba, alberja, cebada, trigo, avena, quinua, chocho, isaño zanahoria, cebolla, lechuga, papaliza, Arasne.

¿Que variedades de cultivo tienen?

Papa= waycha, chuño blanco, negro, rosado, negro, blanco, chiyar imilla, negro, jampatú rojo, negro, Liñee, sana imilla, peruanita Wila imilla, papa waicho.
Oca= Jangu Qiñi, Cuello Qiñi, chiyara Qiñi.
Haba= vacay, Uchuculo, Usnayo.
Arbeja= blanco, wila arbeja,
cebada= cebada, chiyara mero, clara cebada, cilpia cebada jankú cebada.
trigo= trigo blanco.
Avena= chiyara Avena, Jangu Avena.



Quinua= Jangu, Gillu, Wila, Lupha, blanco, negro, verde, rojo.
Chuño= chuño negro y blanco, chiji.
Isaño= Gillu Isaño, amarillo Isaño, Negro Isaño.

Nombre	descripción	uso	propiedades.
Papa, Waicha	Blanco y Negro y Rojo	para cocinar, chuño, tunta Muraya, y para sembrar.	Normal con el sol.
Oca	amarillo, // Blanco y Negro	para cocinar, Caya, una caya, para sembrar	//
Quinua	blanco, Negro, Rojo	Pesque, sopa, torta dequinua, galleta de quinua, cañihua, sopa, Pesque, chaquiña, etc.	//
Habas	Verde	tostado, Mote, sopa de haba pito.	//
oveja	//	//	//
cebada	amarillo.	refresco, tostado pito etc	//
chuchu	amarillo, negro, blanco	refresco, Jugo, pito, etc.	//
isaño	amarillo, blanco y Rojo	para cocinar	

¿Quien Sabe mas las ~~agricultivo~~ en tu familia sobre las variedades agricolas?

Mama, Papa, Yo.

Transcription

Así vivimos en Santiago de Okola

Nombre: *-----*
¿Cuál es la ocupación de tus padres?
R. *- Mi papá hace la agricultura como por ejemplo siembra.*
- Mi papá tiene la ocupación de cuidar las parcelas, animales, y hace la agricultura.
- Mi mamá tiene la ocupación de [unclear]*, pastear ovejas, cuida la casa.*
- Mi hermana mayor se llama Beatriz y está en Chile trabajando en una tienda de celulares.
- Mi hermano está en la ciudad de La Paz y estudiando en ingeniería ambiental. Se llama Moises.
- Mi hermana igual estudia en la ciudad de La Paz en ingeniería de geólogo. Se llama Elvira.
¿Tienes ganado y qué tienes?
Yo tengo en mi casa la oveja, chancho, gallina, vaca, conejo, burro.

1. *Oveja - 15 - yo uso para carne, lana, leche, queso y para venderlas en la Paz en feria del Alto.*
2. *Chancho - 1 - yo uso para carne.*
3. *Vaca - 2 - yo uso carne, leche, cuero, queso, trabajos agricolas con arado y para …*
4. *Conejo - 6 - carne y para vender.*
5. *Burro - 1 - carne y para llevar cargas y para vender.*
6. *Gallina - 4 - carne y huevo.*

¿Que producen en sus parcelas?
En mi parcela tengo o producimos papas, oca, haba, arveja, cebada, trigo, avena, quinua, choclo, isaño, zanahoria, cebolla, lechuga, papaliza, durazno.
¿Qué variedades de cultivo tienen?
Papa: *Waycha, chuño blanco y negro, rosado, negro, blanco, chyar imilla, negro, jampatú rojo, negro, jene, sana imilla, peruanita, wila imilla, waicha.*
Oca: *Janqu, Q'ini, DuÍllu Q'ini, ch'iyara Q'ini.*
Haba: *vacay, uchuculu, usnayo.*
Arveja: *blanco, wila arveja.*
Cebada: *cebada ch'iyara, moro k'ara cebada, cilpin cebada, janku cebada.*
Trigo: trigo blanco.
Avena: *ch'iyara avena, janq'u avena.*
Quinua: *Janq'u, Quillu, Wila Jupha, blanco, negro, verde, rojo.*
Choclo: *choclo negro y blanco, ch'iji.*
Isaño: *Q'illu Isaño, amarillo isaño, negro isaño.*

Nombre	*Descripción*	*Uso*	*Propiedades*
Papa Waicha	*Blanco, negro y rojo*	*Para cocinar, chuño, tunta, muraya y para sembrar*	*Normal con el sol*
Oca	*Amarillo, blanco y negro*	*Para cocinar, caya, uma caya, para sembrar*	*"*
Quinua	*Blanco, negro, rojo*	*Psque, harina, torta de quinua, galleta de quinua, casbirra, sopa, queque, chispiña, etc.*	*"*
Haba	*Verde*	*Tostado, mote, sopa de haba, pito*	*"*
Arveja	*"*	*"*	*"*
Cebada	*Amarillo*	*Refresco, tostado, pito, etc.*	*"*
Choclo	*Amarillo, negro, blanco*	*Refresco, jugo, pito, etc.*	*"*
Isaño	*Amarillo, blanco y negro*	*Para cocinar*	

¿Quién sabe mas en tu familia sobre las variedades agrícolas?
Mama, papa y yo.

(*) This information was the result of one of the school girl's work and commitment. She retrieved some of the information she included in her assignment by speaking with her mother. Furthermore, in two separate moments she was guided in the preparation by two of my research assistants, who were hosted by her family as paying guests.

ANNEX 5. List of questions used as a basis for semi-structured interviews

Guía de preguntas para agricultor general

Nombre del agricultor:
Género:
Edad:

Adquisición de semilla

1. ¿Generalmente de dónde obtiene usted la semilla (por ejemplo tubérculos y granos)?
   - Propia
   - Pariente
   - Comunario
   - ONG
   - Mercado
   - Feria de agrobiodiversidad …
2. ¿Por qué? (calidad, confianza…)
3. ¿A cambio de qué?
   - Compra
   - Regalo
   - Intercambio
4. ¿En qué época consigue la semilla?
5. ¿Viaja usted para conseguir semilla?
6. ¿Cómo ha obtenido su primera semilla?
7. ¿Cuáles son las semillas que más le gustan/que más cuida?
8. ¿Después de la cosecha que hace con el producto?
   - Regalos
   - Venta
   - Transformación
   - Trueque …

Agrobiodiversidad

9. ¿Cuántas variedades de papa/de quinua/de cañahua/de oca ha sembrado este año?
   - De 1 a 5
   - De 5 a 10
   - De 10 a 20
   - Más
10. ¿Y cuáles?
11. ¿Por qué se abandonan ciertas variedades?
12. ¿Va a vender algo de lo que ha cosechado? ¿Y dónde?
13. ¿Vende su producto en alguna feria? ¿Cuál? ¿Qué le resulta más fácil/más rentable vender?

Conocimientos

14. ¿En la comunidad quiénes son las personas que más saben sobre los cultivos?
    - Hombres
    - Mujeres

- Ancianos
- ¿Quiénes son? (Nombres)

15. ¿Quién le enseñó sobre el cuidado de las semillas/de los cultivos?
16. ¿Cómo ha aprendido a distinguir entre las variedades de papa/quinua/cañahua/oca?
    - Distintas variedades
    - Usos
17. ¿Los jóvenes saben de agricultura?
18. ¿Qué les enseña a sus hijos?
19. ¿Qué hacen sus hijos?
20. ¿Sus hijos hablan Aymará? ¿Y los hijos de sus hijos?
21. ¿Qué espera para el futuro de sus hijos?

Migración

22. ¿En la comunidad hay gente que ha ido/quiere ir a vivir a otro lugar?
    ¿A dónde?
    ¿Por qué?
23. ¿Siempre ha sido así en la comunidad?
    ¿Desde cuándo se ha vuelto más fuerte?
24. ¿En los últimos diez años cuántas personas se habrán ido aproximadamente?
25. ¿Quiénes son los que se van más?
    - Los hombres
    - Las mujeres
    - Los jóvenes …
26. ¿Los que se van vuelven nunca a la comunidad? ¿Cuándo? ¿Por qué?
27. ¿Y siguen dedicándose a la agricultura?
28. ¿Qué cultivan? ¿Qué productos? ¿Qué variedades?
29. ¿De la comunidad viaja usted nunca a otro lugar?
    ¿A dónde?
    ¿Por qué?
    ¿Qué hace cuando está allá?
    ¿Por cuánto tiempo se queda?
30. ¿Los que se van envían/traen algo a sus familiares?
    - Dinero
    - Productos
    - Comida …
31. ¿Según su opinión cómo afecta que muchos hermanos se vayan de la comunidad?
    - Más/menos recursos
    - Ingresos
    - Conocimientos …
32. ¿Los residentes tienen más o menos semilla que los pobladores? ¿Tienen maquinaria? ¿Usan químicos?

<u>Ampliación para agricultor custodio</u>

1. ¿Cuáles son las responsabilidades de un agricultor custodio?
    - Conservar un gran número de variedades
    - Distribuir semilla a los agricultores de la comunidad
    - Preocuparse del banco comunal
    - Salvar semilla …
2. ¿Según su opinión cuál es la más importante? ¿Y la más difícil?
3. ¿Cómo se han seleccionado a los custodios?
4. ¿Qué le pareció el proceso?

5. ¿Cambiaría algo?
6. ¿Quiénes son los que más saben en la comunidad?
7. ¿Quiénes son los que más variedades tienen?
8. ¿Quiénes son los más curiosos/los más innovadores?

Para residente

1. ¿Dónde vive usted?
2. ¿Hace cuánto se fue de la comunidad? ¿Por qué?
3. ¿A qué se dedica en …?
4. ¿Tiene familia en la ciudad? ¿Tiene familia en la comunidad?
5. ¿Tiene casa en la comunidad? ¿Tiene parcelas?
6. ¿Qué cultiva?
7. ¿Tiene variedades distintas? ¿Cuáles?
8. ¿De dónde consigue usted la semilla?
9. ¿Quién cuida sus parcelas?
10. ¿Quién siembra? ¿Quién cosecha?
11. ¿Usa maquinaria? ¿Usa químicos?
12. ¿Qué hace usted con el producto?
13. ¿Qué trae usted a sus familiares desde …?
14. ¿Cómo participa usted a la vida de la comunidad?

Para participantes a turismo comunitario

1. ¿Participa usted al turismo comunitario?
2. ¿Por qué sí?/ ¿Por qué no?
3. ¿Cómo participa?
4. ¿Cómo ha empezado el turismo comunitario en Okola? ¿Quiénes han sido los primeros agricultores que se han involucrado? ¿Por qué?
5. ¿Cómo se animó usted a participar?
6. ¿Qué le trae el turismo comunitario?
7. ¿Piensa usted que el turismo le quite tiempo para la agricultura?
8. ¿Participa usted a otras actividades en la comunidad? ¿Tiene usted algún rol en la comunidad? ¿Quisiera usted tener algún rol?
    - Autoridad tradicional
    - Agricultor custodio
    - Iniciativas de ONGs…

ANNEX 6. Survey questionnaire

PROYECTO ANDESCROP - ENCUESTA SOCIOECONÓMICA (**)

Nr. Encuesta		Encuestador		Fecha		Código	

1. Nombre			Numero de miembros en la familia	
2. Comunidad	Municipio	Cantón	Coordenadas UTM - X	- Y

N.		Relación familiar	3. Sexo	4. Edad	5. Religión			6. Idiomas que habla								
					Católico/a	Evangélico/a	Otro/a	Castellano			Aymara			Quechua		
								L	E	H	L	E	H	L	E	H
1	Papá															
2	Mamá															
3	1º Hijo (a)															
4	2º Hijo (a)															
5	3º Hijo (a)															
6	4º Hijo (a)															
7	5º Hijo (a)															
8	Abuelo															
9	Abuela															
10	Nieto (a)															
11	Nieto (a)															
12	Otro (a)															
13	Otro (a)															

L: Lee; E: Escribe; H: Habla

MIGRACIÓN

Llenar el siguiente cuadro en el mismo orden que el anterior:

N.	Relación familiar	7. ¿Dónde vivía hace 5 años?	8. Migró? Sí/no	9. ¿A dónde?	10. ¿Hace cuánto tiempo?	11. ¿Por qué razón?	12. ¿Cómo ayuda en el hogar?
1	Papá						
2	Mamá						
3	1º Hijo (a)						
4	2º Hijo (a)						
5	3º Hijo (a)						
6	4º Hijo (a)						
7	5º Hijo (a)						
8	Abuelo						
9	Abuela						
10	Nieto (a)						
11	Nieto (a)						
12	Otro (a)						
13	Otro (a)						

SALUD

¿Quiénes en el hogar han tenido alguna enfermedad desde enero del 2011 a la fecha? (Llenar el siguiente cuadro en el mismo orden que el anterior)

N.	Miembro de la familia	¿Qué clase de enfermedad tuvo o tiene?	13. ¿Cuándo tiene problemas de salud a donde acude?						
			Caja de salud	Seguro privado	Establecimiento de salud publico	Establecimiento de salud privado	Medico tradicional	Soluciones caseras	Farmacia/automedicación
1	Papá								
2	Mamá								
3	1º Hijo (a)								
4	2º Hijo (a)								
5	3º Hijo (a)								
6	4º Hijo (a)								
7	5º Hijo (a)								
8	Abuelo								
9	Abuela								
10	Nieto (a)								
11	Nieto (a)								
12	Otro (a)								
13	Otro (a)								

EDUCACIÓN

Llenar el siguiente cuadro en el mismo orden que el anterior:

N.	Miembro de la familia	14. ¿Actualmente asiste a algún centro de educación? Sí o No	15. ¿Cuál fue el nivel más alto de instrucción que aprobó?				
			No estudió	Año escolar	Programa de alfabetización	Universitario	No universitario
1	Papá						
2	Mamá						
3	1º Hijo (a)						
4	2º Hijo (a)						
5	3º Hijo (a)						
6	4º Hijo (a)						
7	5º Hijo (a)						
8	Abuelo						
9	Abuela						
10	Nieto (a)						
11	Nieto (a)						
12	Otro (a)						
13	Otro (a)						

VIVIENDA

16. Tipo de vivienda

Casa pareada; Casa no pareada; Habitación(es) suelta(s); Vivienda improvisada; Vivienda precaria

17. ¿Cuál es el material de construcción más utilizado en las paredes exteriores de esta vivienda?

Ladrillo/hormigón; Adobe/tapial; Tabique; Piedra; Madera

18. ¿Las paredes interiores de esta vivienda tienen revoque?

Sí; No

19. ¿Cuál es el material más utilizado en los techos de esta vivienda?

Calamina o plancha metálica; Loza de hormigón armado; Teja de arcilla, teja de cemento/fibrocemento; Paja/barro; Otro

20. ¿Cuál es el material más utilizado en los pisos de esta vivienda?

Tierra; Machihembre; Tablón de madera; Parquet; Cerámica; Cemento; Ladrillo; Mosaico/baldosa; Otro

21. Principalmente ¿el agua que usan en la vivienda proviene de?

Cañería de red; Pileta publica; Repartidor (aguatero); Pozo con bomba; Pozo sin bomba; Lluvia; Lago, laguna; Rio, vertiente, acequia; Otro

22. El agua que usan en la vivienda se distribuye por:

Cañería dentro de la vivienda; Cañería fuera de la vivienda, pero dentro del terreno; Cañería fuera de la vivienda y del terreno; No se distribuye por cañería

23. ¿Tiene servicio sanitario, baño o letrina?

Sí; No

Si tiene servicio sanitario, baño o letrina, este es de uso:

Privado; Compartido

24. ¿El servicio sanitario, baño o letrina tiene desagüe?

Alcantarillado; Cámara séptica; Pozo ciego; Lago, laguna; Quebrada, rio

25. ¿Tienen energía eléctrica?

Sí, No

Si tiene energía eléctrica, esta proviene de:

Servicio publico; Motor propio; Panel solar; Otro

26. ¿Tiene una habitación solo para cocinar?

Sí; No

27. Cual es la fuente de energía que utiliza para cocinar?

Gas natural; GLP; Electricidad; Energía solar; Lena; Guano, bosta o taquia; Otro

28. ¿Cómo eliminan principalmente su basura?

En el basurero; Botan en terreno baldío o en la calle; Botan al rio; Queman; Entierran; Otra forma

29. Este hogar tiene:

Radio; Televisor; Computadora; Teléfono fijo o celular; Vehículo automotor; Tractor; Bote o canoa; Bicicleta; Motocicleta; Otro

30. ¿La vivienda que ocupa este hogar es?

Propia; Alquilada; Contrato anticrético; Cedida por servicio; Prestada por parientes o amigos; Otro

TENENCIA Y USO DE LA TIERRA

Por ciclos	2010/2011					2011/2012				
31. Total de superficie que se posee	Cant.		Unidad:			Cant.		Unidad:		
32. Superficie preparada o roturada	Cant.		Unidad:			Cant.		Unidad:		
33. Superficie sembrada	Cant.		Unidad:			Cant.		Unidad:		
34. Superficie en descanso	Cant.		Unidad:			Cant.		Unidad:		
35. Superficie con pastizales	Cant.		Unidad:			Cant.		Unidad:		
36. Superficie no cultivada	Cant.		Unidad:			Cant.		Unidad:		
37. Superficie de la tierra según propiedad (%)	Propia	Prestado	Alquiler	Al partir	Comunal	Propia	Prestado	Alquiler	Al partir	Comunal
38. Terreno propio	Herencia		Compra			Herencia		Compra		
39. Titulo de propiedad de terreno propio	Sí		No			Sí		No		

PRODUCCIÓN AGRÍCOLA

40. ¿ Cuáles son los principales cultivos que produce? (según orden de importancia)

_____

Ahora les vamos a preguntar acerca de los cultivos sembrados en la gestión agrícola 2011-2012.

Nombre	Cultivo 1:				Cultivo 2:			
41. Superficie sembrada	Cantidad:		Unidad:		Cantidad:		Unidad:	
42. Topografía de la parcela	Plano	Levemente inclinado	Muy inclinado		Plano	Levemente inclinado	Muy inclinado	
43. Preparación del suelo	Tractor	Yunta	Manual	No prepara	Tractor	Yunta	Manual	No prepara
44. Cantidad de semilla siembra	Cantidad:		Unidad:		Cantidad:		Unidad:	
45. Tamaño de la semilla	Grande	Mediano	Pequeño	Muy pequeño	Grande	Mediano	Pequeño	Muy pequeño
46. Origen de la semilla	Propia	Vecino	Ciudad	Feria local	Propia	Vecino	Ciudad	Feria local
47. Cultivo tiene riego	Sí		No		Sí		No	
48. Uso fertilizante químico	Sí		No		Sí		No	
49. Tipo de fertilizante químico	Urea	Fosfato	Otro		Urea	Fosfato	Otro	
50. Periodo y cantidad de uso de fertilizante químico	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	

51. Usa abono natural	Sí		No		Sí		No	
52. Tipo de abono natural	Bovino	Ovino	Camélido	Otro	Bovino	Ovino	Camélido	Otro
53. Periodo y cantidad de uso de abono natural	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
54. Cantidad cosechada	Cantidad:	Unidad:			Cantidad:	Unidad:		
55. Porcentaje de pérdida (%)								
56. Razones de pérdidas de cultivos	Plagas	Heladas	Sequia	Granizo	Plagas	Heladas	Sequia	Granizo
	%	%	%	%	%	%	%	%
57. Destino de la producción	Consumo	Venta	Trueque	Semilla	Transf.	Consumo	Venta	Trueque	Semilla	Transf.
	%	%	%	%	%	%	%	%	%	%

Costo de producción	Mano de obra		Mano de obra	
58. Cantidad de personas que trabajaron en el cultivo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
59. Cantidad de personas que se pagaron en el trabajo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:

	Insumos		Insumos	
60. Preparación terreno (Tractor)	n. Horas:	Bs./Hora:	n. Horas:	Bs./Hora:
61. Preparación terreno (Yunta)	n. Días	Bs./Día:	n. Días	Bs./Día:
62. Siembra - Yunta	n. Días	Bs./Día:	n. Días	Bs./Día:
63. Labores culturales (Tractor)	n. Horas:	Bs./Hora:	n. Horas:	Bs./Hora:
64. Labores culturales (Yunta)	n. Días	Bs./Día:	n. Días	Bs./Día:

65. Fertilizante químico	Fosfato	Cant.	Costo:	Fosfato	Cant.	Costo:
	Urea	Cant.	Costo	Urea	Cant.	Costo
66. Abono natural	Nom.	Cant.	Costo	Nom.	Cant.	Costo
67. Pesticidas	Nom.	Cant.	Costo	Nom.	Cant.	Costo
	Nom.	Cant.	Costo	Nom.	Cant.	Costo
68. Almacenamiento del producto	Lugar (sitio)	Tiempo (meses)	Perdidas (%)	Lugar (sitio)	Tiempo (meses)	Perdidas (%)

Nombre	Cultivo 3:		Cultivo 4:	
69. Superficie sembrada	Cantidad:	Unidad:	Cantidad:	Unidad:

70. Topografía de la parcela	Plano	Levemente inclinado	Muy inclinado	Plano	Levemente inclinado	Muy inclinado

71. Preparación del suelo	Tractor	Yunta	Manual	No prepara	Tractor	Yunta	Manual	No prepara
72. Cantidad de semilla siembra	Cantidad:		Unidad:		Cantidad:		Unidad:	
73. Tamaño de la semilla	Grande	Mediano	Pequeño	Muy pequeño	Grande	Mediano	Pequeño	Muy pequeño
74. Origen de la semilla	Propia	Vecino	Ciudad	Feria local	Propia	Vecino	Ciudad	Feria local
75. Cultivo tiene riego	Sí		No		Sí		No	
76. Uso fertilizante químico	Sí		No		Sí		No	
77. Tipo de fertilizante químico	Urea	Fosfato	Otro		Urea	Fosfato	Otro	
78. Periodo y cantidad de uso de fertilizante químico	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
79. Usa abono natural	Sí		No		Sí		No	
80. Tipo de abono natural	Bovino	Ovino	Camélido	Otro	Bovino	Ovino	Camélido	Otro
81. Periodo y cantidad de uso de abono natural	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
82. Cantidad cosechada	Cantidad:		Unidad:		Cantidad:		Unidad:	
83. Porcentaje de pérdida (%)								
84. Razones de pérdidas de cultivos	Plagas	Heladas	Sequia	Granizo	Plagas	Heladas	Sequia	Granizo
	%	%	%	%	%	%	%	%
85. Destino de la producción	Consumo	Venta	Trueque	Semilla	Transf.	Consumo	Venta	Trueque	Semilla	Transf.
	%	%	%	%	%	%	%	%	%	%

Costo de producción	Mano de obra		Mano de obra	
86. Cantidad de personas que trabajaron en el cultivo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
87. Cantidad de personas que se pagaron en el trabajo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha

	n. Jornales:		n. Jornales:	n. Jornales:		n. Jornales:
	Insumos			Insumos		
88. Preparación terreno (Tractor)	n. Horas:		Bs./Hora:	n. Horas:		Bs./Hora:
89. Preparación terreno (Yunta)	n. Días		Bs./Día:	n. Días		Bs./Día:
90. Siembra - Yunta	n. Días		Bs./Día:	n. Días		Bs./Día:
91. Labores culturales (Tractor)	n. Horas:		Bs./Hora:	n. Horas:		Bs./Hora:
92. Labores culturales (Yunta)	n. Días		Bs./Día:	n. Días		Bs./Día:
93. Fertilizante químico	Fosfato	Cant.	Costo:	Fosfato	Cant.	Costo:
	Urea	Cant.	Costo	Urea	Cant.	Costo
94. Abono natural	Nom.	Cant.	Costo	Nom.	Cant.	Costo
95. Pesticidas	Nom.	Cant.	Costo	Nom.	Cant.	Costo
	Nom.	Cant.	Costo	Nom.	Cant.	Costo
96. Almacenamiento del producto	Lugar (sitio)	Tiempo (meses)	Perdidas (%)	Lugar (sitio)	Tiempo (meses)	Perdidas (%)

Nombre	Cultivo 5:				Cultivo 6:			
97. Superficie sembrada	Cantidad:		Unidad:		Cantidad:		Unidad:	
98. Topografía de la parcela	Plano	Levemente inclinado	Muy inclinado		Plano	Levemente inclinado	Muy inclinado	
99. Preparación del suelo	Tractor	Yunta	Manual	No prepara	Tractor	Yunta	Manual	No prepara
100. Cantidad de semilla siembra	Cantidad:		Unidad:		Cantidad:		Unidad:	
101. Tamaño de la semilla	Grande	Mediano	Pequeño	Muy pequeño	Grande	Mediano	Pequeño	Muy pequeño
102. Origen de la semilla	Propia	Vecino	Ciudad	Feria local	Propia	Vecino	Ciudad	Feria local
103. Cultivo tiene riego	Sí		No		Sí		No	
104. Uso fertilizante químico	Sí		No		Sí		No	
105. Tipo de fertilizante químico	Urea	Fosfato	Otro		Urea	Fosfato	Otro	
106. Periodo y cantidad de uso de fertilizante químico	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
107. Usa abono natural	Sí		No		Sí		No	
108. Tipo de abono natural	Bovino	Ovino	Camélido	Otro	Bovino	Ovino	Camélido	Otro
109. Periodo y cantidad de	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	

uso de abono natural						
110. Cantidad cosechada	Cantidad:	Unidad:		Cantidad:	Unidad:	
111. Porcentaje de pérdida (%)						

112. Razones de pérdidas de cultivos	Plagas	Heladas	Sequia	Granizo	Plagas	Heladas	Sequia	Granizo
	%	%	%	%	%	%	%	%

113. Destino de la producción	Consumo	Venta	Trueque	Semilla	Transf.	Consumo	Venta	Trueque	Semilla	Transf.
	%	%	%	%	%	%	%	%	%	%

Costo de producción	Mano de obra		Mano de obra	
114. Cantidad de personas que trabajaron en el cultivo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
115. Cantidad de personas que se pagaron en el trabajo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:

	Insumos		Insumos	
116. Preparación terreno (Tractor)	n. Horas:	Bs./Hora:	n. Horas:	Bs./Hora:
117. Preparación terreno (Yunta)	n. Días	Bs./Día:	n. Días	Bs./Día:
118. Siembra - Yunta	n. Días	Bs./Día:	n. Días	Bs./Día:
119. Labores culturales (Tractor)	n. Horas:	Bs./Hora:	n. Horas:	Bs./Hora:
120. Labores culturales (Yunta)	n. Días	Bs./Día:	n. Días	Bs./Día:

121. Fertilizante químico	Fosfato	Cant.	Costo:	Fosfato	Cant.	Costo:
	Urea	Cant.	Costo	Urea	Cant.	Costo
122. Abono natural	Nom.	Cant.	Costo	Nom.	Cant.	Costo
123. Pesticidas	Nom.	Cant.	Costo	Nom.	Cant.	Costo
	Nom.	Cant.	Costo	Nom.	Cant.	Costo
124. Almacenamiento del producto	Lugar (sitio)	Tiempo (meses)	Perdidas (%)	Lugar (sitio)	Tiempo (meses)	Perdidas (%)

Nombre	Cultivo 7:			Cultivo 8:		
125. Superficie sembrada	Cantidad:	Unidad:		Cantidad:	Unidad:	
126. Topografía de la parcela	Plano	Levemente inclinado	Muy inclinado	Plano	Levemente inclinado	Muy inclinado

127. Preparación del suelo	Tractor	Yunta	Manual	No prepara	Tractor	Yunta	Manual	No prepara
128. Cantidad de semilla siembra	Cantidad:	Unidad:			Cantidad:	Unidad:		

129. Tamaño de la semilla	Grande	Mediano	Pequeño	Muy pequeño	Grande	Mediano	Pequeño	Muy pequeño
130. Origen de la semilla	Propia	Vecino	Ciudad	Feria local	Propia	Vecino	Ciudad	Feria local
131. Cultivo tiene riego	Sí		No		Sí		No	
132. Uso fertilizante químico	Sí		No		Sí		No	
133. Tipo de fertilizante químico	Urea	Fosfato	Otro		Urea	Fosfato	Otro	
134. Periodo y cantidad de uso de fertilizante químico	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
135. Usa abono natural	Sí		No		Sí		No	
136. Tipo de abono natural	Bovino	Ovino	Camélido	Otro	Bovino	Ovino	Camélido	Otro
137. Periodo y cantidad de uso de abono natural	Prep. terreno	Siembra	Aporque		Prep. terreno	Siembra	Aporque	
	Cant.	Cant.	Cant.		Cant.	Cant.	Cant.	
138. Cantidad cosechada	Cantidad:	Unidad:			Cantidad:	Unidad:		
139. Porcentaje de pérdida (%)								
140. Razones de pérdidas de cultivos	Plagas	Heladas	Sequia	Granizo	Plagas	Heladas	Sequia	Granizo
	%	%	%	%	%	%	%	%
141. Destino de la producción	Consumo	Venta	Trueque	Semilla	Transf.	Consumo	Venta	Trueque	Semilla	Transf.
	%	%	%	%	%	%	%	%	%	%

Costo de producción	Mano de obra		Mano de obra	
142. Cantidad de personas que trabajaron en el cultivo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
143. Cantidad de personas que se pagaron en el trabajo	Preparación terreno	Siembra	Preparación terreno	Siembra
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:
	Labores culturales	Cosecha	Labores culturales	Cosecha
	n. Jornales:	n. Jornales:	n. Jornales:	n. Jornales:

	Insumos			Insumos		
144. Preparación terreno (Tractor)	n. Horas:		Bs./Hora:	n. Horas:		Bs./Hora:
145. Preparación terreno (Yunta)	n. Días		Bs./Día:	n. Días		Bs./Día:
146. Siembra - Yunta	n. Días		Bs./Día:	n. Días		Bs./Día:
147. Labores culturales (Tractor)	n. Horas:		Bs./Hora:	n. Horas:		Bs./Hora:
148. Labores culturales (Yunta)	n. Días		Bs./Día:	n. Días		Bs./Día:
149. Fertilizante químico	Fosfato	Cant.	Costo:	Fosfato	Cant.	Costo:
	Urea	Cant.	Costo	Urea	Cant.	Costo
150. Abono natural	Nom.	Cant.	Costo	Nom.	Cant.	Costo
151. Pesticidas	Nom.	Cant.	Costo	Nom.	Cant.	Costo
	Nom.	Cant.	Costo	Nom.	Cant.	Costo
153. Almacenamiento del producto	Lugar (sitio)	Tiempo (meses)	Perdidas (%)	Lugar (sitio)	Tiempo (meses)	Perdidas (%)

BIODIVERSIDAD

Ahora les vamos a preguntar acerca de la biodiversidad de sus cultivos.

Variedades por cultivo	20 anos atrás	10 años atrás	2011-2012
153. Variedades de papa			
154. Variedades de quinua			
155. Variedades de cañahua			
156. Variedades de tarwi			
157. Variedades de oca			
158. Variedades de ajipa			

Variedades de papa nativa	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
159. Nombre variedad					
160. Traducción nombre variedad					
161. Tipo de suelo para la variedad					
162. Época de siembra (mes)					
163. Tipo de variedad (amarga, dulce)					
164. Área sembrada (hectárea)					
165. Cantidad producida (cant. y unidad)					
166. Destino producción - Consumo (%)					
167. Destino producción - Venta (%)					
168. Destino producción - Semilla (%)					
169. Destino producción - Trueque (%)					
170. Destino producción - Transformación (%)					
171. Transformación productos nombre					
172. Perdidas por enfermedades (%)					
173. Control de enfermedad (Sí/No)					
174. Nombre principal enfermedad					

175. Perdidas por plagas (%)					
176. Control de plagas (Sí/No)					
177. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
178. Tamaño del tubérculo (Grande, med. Peq.)					
179. Velocidad de cocción (rápido, lento)					
180. Sabor (agradable, no agradable)					
181. Consistencia					
182. Facilidad de pelado					
183. Valor nutritivo (alto, medio, bajo)					
184. Uso principal como alimento					
185. Uso secundario como alimento					
186. Uso medicinal principal					
187. Otros usos					

Variedades de quinua	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
188. Nombre variedad					
189. Traducción nombre variedad					
190. Tipo de suelo para la variedad					
191. Época de siembra (mes)					
192. Tipo de variedad (amarga, dulce)					
193. Área sembrada (hectárea)					
194. Cantidad producida (cant. y unidad)					
195. Destino producción - Consumo (%)					
196. Destino producción - Venta (%)					
197. Destino producción - Semilla (%)					
198. Destino producción - Trueque (%)					
199. Destino producción - Transformación (%)					
200. Transformación productos nombre					
201. Perdidas por enfermedades (%)					
202. Control de enfermedades (Sí/No)					
203. Nombre principal enfermedad					
204. Perdidas por plagas (%)					
205. Control de plagas (Sí/No)					

206. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
207. Velocidad de cocción (rápido, lento)					
208. Sabor (agradable, no agradable)					
209. Valor nutritivo (alto, medio, bajo)					
210. Uso principal como alimento					
211. Uso secundario como alimento					
212. Uso medicinal principal					
213. Otros usos					

Variedades de cañahua	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
214. Nombre variedad					
215. Traducción nombre variedad					
216. Tipo de suelo para la variedad					
217. Época de siembra (mes)					
218. Área sembrada (hectárea)					
219. Cantidad producida (cant. y unidad)					
220. Destino producción - Consumo (%)					
221. Destino producción - Venta (%)					
222. Destino producción - Semilla (%)					
223. Destino producción - Trueque (%)					
224. Destino producción - Transformación (%)					
225. Transformación productos nombre					
226. Perdidas por enfermedades (%)					
227. Control de enfermedades (Sí/No)					
228. Nombre principal enfermedad					
229. Perdidas por plagas (%)					
230. Control de plagas (Sí/No)					
231. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
232. Velocidad de cocción (rápido, lento)					
233. Sabor (agradable, no agradable)					
234. Valor nutritivo (alto, medio, bajo)					

235. Uso principal como alimento					
236. Uso secundario como alimento					
237. Uso medicinal principal					
238. Otros usos					

Variedades de oca	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
239. Nombre variedad					
240. Traducción nombre variedad					
241. Tipo de suelo para la variedad					
242. Época de siembra (mes)					
243. Tipo de variedad (amarga, dulce)					
244. Área sembrada (hectárea)					
245. Cantidad producida (cant. y unidad)					
246. Destino producción - Consumo (%)					
247. Destino producción - Venta (%)					
248. Destino producción - Semilla (%)					
249. Destino producción - Trueque (%)					
250. Destino producción - Transformación (%)					
251. Transformación productos nombre					
252. Perdidas por enfermedades (%)					
253. Control de enfermedades (Sí/No)					
254. Nombre principal enfermedad					
255. Perdidas por plagas (%)					
256. Control de plagas (Sí/No)					
257. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
258. Tamaño del tubérculo (grande, med. Peq.)					
259. Velocidad de cocción (rápido, lento)					
260. Sabor (agradable, no agradable)					
261. Consistencia					
262. Valor nutritivo (alto, medio, bajo)					
263. Uso principal como alimento					
264. Uso secundario como alimento					
265. Uso medicinal principal					

266. Otros usos					

Variedades de tarwi	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
267. Nombre variedad					
268. Traducción nombre variedad					
269. Tipo de suelo para la variedad					
270. Época de siembra (mes)					
271. Área sembrada (hectárea)					
272. Cantidad producida (cant. y unidad)					
273. Destino producción - Consumo (%)					
274. Destino producción - Venta (%)					
275. Destino producción - Semilla (%)					
276. Destino producción - Trueque (%)					
277. Destino producción - Transformación (%)					
278. Transformación productos nombre					
279. Perdidas por enfermedades (%)					
280. Control de enfermedades (Sí/No)					
281. Nombre principal enfermedad					
282. Perdidas por plagas (%)					
283. Control de plagas (Sí/No)					
284. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
285. Tamaño del tubérculo (grande, med. Peq.)					
286. Velocidad de cocción (rápido, lento)					
287. Sabor (agradable, no agradable)					
288. Consistencia					
289. Valor nutritivo (alto, medio, bajo)					
290. Uso principal como alimento					
291. Uso secundario como alimento					
292. Uso medicinal principal					
293. Otros usos					

Variedades de ajipa	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
294. Nombre variedad					

295. Traducción nombre variedad					
296. Tipo de suelo para la variedad					
297. Época de siembra (mes)					
298. Tipo de variedad (amarga, dulce)					
299. Área sembrada (hectárea)					
300. Cantidad producida (cant. y unidad)					
301. Destino producción - Consumo (%)					
302. Destino producción - Venta (%)					
303. Destino producción - Semilla (%)					
304. Destino producción - Trueque (%)					
305. Destino producción - Transformación (%)					
306. Transformación productos nombre					
307. Perdidas por enfermedades (%)					
308. Control de enfermedades (Sí/No)					
309. Nombre principal enfermedad					
310. Perdidas por plagas (%)					
311. Control de plagas (Sí/No)					
312. Nombre principal plaga					
Calidad, valor nutritivo y usos del producto	Variedad 1	Variedad 2	Variedad 3	Variedad 4	Variedad 5
313. Tamaño de la raiz (grande, med. Peq.)					
314. Forma de consumo (crudo, cocido)					
315. Sabor (agradable, no agradable)					
316. Consistencia					
317. Facilidad de pelado					
318. Valor nutritivo (alto, medio, bajo)					
319. Uso principal como alimento					
320. Uso secundario como alimento					
321. Uso medicinal principal					
322. Otros usos					

TRANSFORMACIÓN

Ahora les vamos a preguntar acerca de la transformación de sus cultivos:

Cultivo de papa nativa	Subproducto N. 1	Subproducto N. 2	Subproducto N. 3
323. Nombre del			

subproducto									
324. Cantidad que transforma por año	Cant.		Unid.	Cant.		Unid.	Cant.		Unid.
325. Frecuencia de transformación									
326. Destino de producción (%)	Consumo		Venta	Consumo		Venta	Consumo		Venta
327. Cantidad de venta del subproducto	Cant.		Unid.	Cant.		Unid.	Cant.		Unid.
328. Lugar y frecuencia venta subproducto	Lug.		Frec.	Lug.		Frec.	Lug.		Frec.
329. Precio de venta de subproducto	Bs.		Unid.	Bs.		Unid.	Bs.		Unid.
330. Costo de producción de subproducto	Bs.		Unid.	Bs.		Unid.	Bs.		Unid.
331. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

Cultivo de quinua	Subproducto N. 1			Subproducto N. 2			Subproducto N. 3		
332. Nombre del subproducto									
333. Cantidad que transforma por año	Cant.		Unid.	Cant.		Unid.	Cant.		Unid.
334. Frecuencia de transformación									
335. Destino de producción (%)	Consumo		Venta	Consumo		Venta	Consumo		Venta
336. Cantidad de venta del subproducto	Cant.		Unid.	Cant.		Unid.	Cant.		Unid.
337. Lugar y frecuencia venta subproducto	Lug.		Frec.	Lug.		Frec.	Lug.		Frec.
338. Precio de venta de subproducto	Bs.		Unid.	Bs.		Unid.	Bs.		Unid.
339. Costo de producción de subproducto	Bs.		Unid.	Bs.		Unid.	Bs.		Unid.
340. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

Cultivo de cañahua	Subproducto N. 1			Subproducto N. 2			Subproducto N. 3		
341. Nombre del subproducto									
342. Cantidad que transforma por año	Cant.	Unid.		Cant.	Unid.		Cant.	Unid.	
343. Frecuencia de transformación									
344. Destino de producción (%)	Consumo	Venta		Consumo	Venta		Consumo	Venta	
345. Cantidad de venta del subproducto	Cant.	Unid.		Cant.	Unid.		Cant.	Unid.	
346. Lugar y frecuencia venta subproducto	Lug.	Frec.		Lug.	Frec.		Lug.	Frec.	
347. Precio de venta de subproducto	Bs.	Unid.		Bs.	Unid.		Bs.	Unid.	
348. Costo de producción de subproducto	Bs.	Unid.		Bs.	Unid.		Bs.	Unid.	
349. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

Cultivo de oca	Subproducto N. 1		Subproducto N. 2		Subproducto N. 3	
350. Nombre del subproducto						
351. Cantidad que transforma por año	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
352. Frecuencia de transformación						
353. Destino de producción (%)	Consumo	Venta	Consumo	Venta	Consumo	Venta
354. Cantidad de venta del subproducto	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
355. Lugar y frecuencia venta subproducto	Lug.	Frec.	Lug.	Frec.	Lug.	Frec.
356. Precio de venta de subproducto	Bs.	Unid.	Bs.	Unid.	Bs.	Unid.
357. Costo de producción de subproducto	Bs.	Unid.	Bs.	Unid.	Bs.	Unid.

358. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

Cultivo de tarwi	Subproducto N. 1		Subproducto N. 2		Subproducto N. 3	
359. Nombre del subproducto						
360. Cantidad que transforma por año	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
361. Frecuencia de transformación						
362. Destino de producción (%)	Consumo	Venta	Consumo	Venta	Consumo	Venta
363. Cantidad de venta del subproducto	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
364. Lugar y frecuencia venta subproducto	Lug.	Frec.	Lug.	Frec.	Lug.	Frec.
365. Precio de venta de subproducto	Bs.	Unid.	Bs.	Unid.	Bs.	Unid.
366. Costo de producción de subproducto	Bs.	Unid.	Bs.	Unid.	Bs.	Unid.

367. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

Cultivo de ajipa	Subproducto N. 1		Subproducto N. 2		Subproducto N. 3	
368. Nombre del subproducto						
369. Cantidad que transforma por año	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
370. Frecuencia de transformación						
371. Destino de producción (%)	Consumo	Venta	Consumo	Venta	Consumo	Venta
372. Cantidad de venta del subproducto	Cant.	Unid.	Cant.	Unid.	Cant.	Unid.
373. Lugar y frecuencia venta subproducto	Lug.	Frec.	Lug.	Frec.	Lug.	Frec.
374. Precio de venta de subproducto	Bs.	Unid.	Bs.	Unid.	Bs.	Unid.

375. Costo de producción de subproducto	Bs.	Unid.		Bs.	Unid.		Bs.	Unid.	
376. Quién mayor, elabora subproducto	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos	Mujer	Hombre	Ambos

PRODUCCIÓN PECUARIA

AMINALES CRIADOS (Anotare numero de animales)	Camélidos		Bovinos		Ovinos		Porcinos		Aves	
	Criollos	Mejorados	Criollos	Mejorados	Criollos	Mejorados	Criollos	Mejorados	Criollos	Mejorados
377. ¿Cantidad de animales?										
378. ¿De estos, cuántos no son de propios?										
379. Desde el 2011 ¿Cuántos animales nacieron?										
380. Desde el 2011 ¿Cuántos animales murieron?										
381. Desde el 2011 ¿Cuántos animales compraron?										
382. ¿A qué precio compró cada animal? (Bs.)										
383. ¿Cuántos animales los destinó al consumo del hogar?										
384. Desde el 2011 ¿Cuántos animales vendieron?										
385. ¿A qué precio los vendió por cabeza? (Bs.)										
386. ¿Cuántos los vendió faenados o carneados?										
387. ¿A cuánto vendió los animales faenados/carneados? (Bs.)										
388. ¿Cuántos animales los destinó al trueque?										
389. ¿Cuántos animales destinó para regalo o herencia?										
390. ¿Dónde duerme el animal?										

391. Gastos mensuales para la crianza de animales										
1. Alimentación (Bs.)										
2. Mano de obra para el cuidado (Bs.)										
3. Veterinario (Bs.)										
4. Faenado o carneado (Bs.)										
5. Otros gastos										

COMERCIALIZACIÓN

392. ¿Cuáles son los seis productos (agrícolas y/o animales y/o subproductos) más importantes de su producción familiar (que le generan más ingresos) desde el 2011 a la fecha? En orden de importancia:

Producto 1	
Producto 2	
Producto 3	
Producto 4	
Producto 5	
Producto 6	

393. ¿Cada cuanto vende estos productos y donde? (directamente a rescatistas, ferias locales, mercados, etc.)

Frecuencia	Producto 1/Lugar(es)	Producto 2/Lugar(es)	Producto 3/Lugar(es)	Producto 4/Lugar(es)	Producto 5/Lugar(es)	Producto 6/Lugar(es)
Cada día						
Una vez por semana						
Cada 15 días						
Una vez al mes						
Cada dos meses						
Una vez al año						
Solo cuando necesita						
Otro (especificar)						

394. ¿Cuáles son los dos mercados más importantes para la venta de sus productos? (Identificar solo dos mercados)

	Nombre del mercado	Cantidad y valor por viaje		Costo del transporte	Tiempo de llegada al mercado	
		Cantidad	Valor (Bs.)		Horas	Días
1						
2						

395. ¿ De quién recibe la mayor cuantidad de información acerca de los precios de sus productos agrícolas y/o animales y/o subproductos?

Fuente de información	Productos Agrícolas	Productos Pecuarios	Productos/Subproductos
1. De los rescatistas y/o comerciantes			
2 De técnicos y/o programas de capacitación			
3. Radio			
4. Miembro de la comunidad que vive en la misma			
5. Miembro de la comunidad que vive en la ciudad			
6. Organización de productores			
7. Otro			

396. ¿Y por lo general quien va a vender estos productos?

Persona que vende	Prod. 1	Prod. 2	Prod. 3	Prod. 4	Prod. 5	Prod.6
1. Sólo uno vende						
2. Solo una mujer						
3. Mayormente los varones						
4. Mayormente las mujeres						
5. Varones y mujeres por igual						
6. Otro						

397. La mayor parte de las veces que lleva sus productos al mercado ¿Cuál de los siguientes sucede y con qué frecuencia?

Suceso	Frecuencia de ocurrencia				
	Siempre	Casi siempre	Algunas veces	Solo en ocasiones	Nunca
1. Sólo uno vende					
2. Solo una mujer					
3. Mayormente los varones					
4. Mayormente las mujeres					
5. Varones y mujeres por igual					
6. Otro					

398. ¿Tiene un contrato escrito o verbal con el/la intermediario/a? Sí/No

399. ¿Tiene alguna relación con el (la) intermediario(a)? Sí/No

400. ¿Si su respuesta es afirmativa ¿Cuál es su relación con el (la) intermediario(a)? Amigo(a); Compadre; Miembro de la comunidad; Transportista; Otro.

401. Cuando el intermediario(a) compra un producto ¿Con qué frecuencia hace uso de los siguientes procedimientos?

Procedimiento	Frecuencia de uso				
	Siempre	Casi siempre	Algunas veces	Solo en ocasiones	Nunca
1. Le da un adelanto antes de la siembra					
2. Le da insumos como semilla o fertilizantes					
3. Siembran al partir y le compra su cosecha					
4. Le espera en el camino principal					
5. Le va a buscar al mercado					
6. Usted los busca para vender su producción					

402. Cuando el(la) intermediario(a) compra un producto, para pagarle ¿Con qué frecuencia hace uso de los siguientes procedimientos?

Procedimiento	Frecuencia de uso				
	Siempre	Casi siempre	Algunas veces	Solo en ocasiones	Nunca
1. Le paga inmediatamente y en efectivo					
2. Le da un adelanto, y luego completa lo que falta					
3. Se niega a pagarle el monto acordado cuando le dió el adelanto					
4. Lleva el producto y le paga después de un tiempo					
5. Es muy exigente con la calidad, el tamaño, etc.					
6. Tiene que rebajar el precio si no no le compra					

7. Regatea y pide rebaja					

403. ¿Cómo vende su producto al intermediario(a)?

Producto	Forma de venta			
	Materia prima	Completamente procesado	Parcialmente procesado	Subproducto

404. ¿Vende o alguna vez ha vendido sus productos a una empresa procesadora? Sí/No

405. Si la respuesta es afirmativa ha firmado un contrato verbal o escrito con la empresa procesadora? Sí/No

406. Cuando la empresa compra un producto ¿con qué frecuencia hace uso de los siguientes procedimientos?

Procedimiento	Frecuencia de uso				
	Siempre	Casi siempre	Algunas veces	Solo en ocasiones	Nunca
1. Le da un adelanto antes de la siembra					
2. Le da insumos como semilla o fertilizantes					
3. Siembran al partir y le compra su cosecha					
4. Recoge de su casa el producto					
5. Le espera en el camino principal					
6. Le va a buscar al mercado					
7. Usted los busca para vender su producción					

407. Cuando la empresa compra un producto, para pagarle ¿con qué frecuencia hace uso de los siguientes procedimientos?

Procedimiento	Frecuencia de uso				
	Siempre	Casi siempre	Algunas veces	Solo en ocasiones	Nunca
1. Le paga inmediatamente y en efectivo					
2. Le da un adelanto, y luego completa lo que falta					
3. Se niega a pagarle el monto acordado cuando le dió el					

adelanto					
4. Lleva el producto y le paga después de un tiempo					
5. Es muy exigente con la calidad, el tamaño, etc.					
6. Tiene que rebajar el precio si no no le compra					
7. Regatea y pide rebaja					

408. ¿Cómo vende su producto a la empresa procesadora?

Producto	Forma de venta			
	Materia prima	Completamente procesado	Parcialmente procesado	Subproducto

409. Si existiese nuevas oportunidades de mercado ¿Dónde le gustaría vender su producto?

410. ¿Alguna vez vendió su producción al municipio para el desayuno escolar? Sí/No

411. Si su respuesta es afirmativa ¿Cuáles son los productos (agrícolas y/o animales y/o subproductos) que vendió?

Producto 1	
Producto 2	
Producto 3	

412. Si su respuesta a la pregunta 412 es negativa ¿Cuáles son las razones por las cuales no vendió?

1. Es complicado
2. No le interesa
3. No tiene suficiente producto para ofertar
4. No sabía que podía hacerlo
5. No dispone da capital
6. No sabe como hacerlo
7. Otra (especificar)

ALIMENTACIÓN

417. ¿Qué es lo que generalmente consume en el desayuno?

418. ¿Qué es lo consume a media mañana?

419. ¿Què es lo que generalmente consume a medio día?

420. ¿Qué es lo que generalmente consume a media tarde?

421. ¿Qué es lo que consume en la noche?

422. ¿Opinion acerca de la calidad nutrituva de los limentos?

Alimento	¿Cuál es la calidad nutrivtiva?	Alimento	¿Cuál es la calidad nutrivtiva?
Arroz		Ajipa	
Quinua		Cebolla	
Cañuahua		Tomate	
Avena		Lechuga	
Cebada		Haba	
Fideo		Arveja	
Pan		Papalisa	
Galleta		Oca	
Papa		Chuño	
Zanahoria		Tunta	
Tarwi		Caya	

423. ¿Frecuencia de consumo de alimentos?

Alimento	Frecuencia (veces por semana)							Alimento	Frecuencia (veces por semana)						
	1	2	3	4	5	6	7		1	2	3	4	5	6	7
Arroz								Ajipa							
Quinua								Cebolla							
Cañuahua								Tomate							
Avena								Lechuga							
Cebada								Haba							
Fideo								Arveja							
Pan								Papalisa							
Galleta								Oca							
Papa								Chuño							
Zanahoria								Tunta							
Tarwi								Caya							

ACTIVIDADES DESARROLLADAS POR HOMBRES Y MUJERES

En este punto necesitamos que nos diga cuales son sus actividades diarias durante una semana

Padre de familia	Lunes	Martes	Miercoles	Jueves	Viernes	Sabado	Domingo
424. Actividades antes de las 8 am							
425. Actividades de 8 am a 12 pm							
426. Actividades de 12 pm a 2 pm							
427. Actividades de 2 pm a 6 pm							
428. Actividades de 6 pm a 8 pm							
429. Actividades después de 8 pm							

Madre de familia	Lunes	Martes	Miercoles	Jueves	Viernes	Sabado	Domingo
430. Actividades antes de las 8 am							
431. Actividades de 8 am a 12 pm							
432. Actividades de 12 pm a 2 pm							
433. Actividades de 2 pm a 6 pm							
434. Actividades de 6 pm a 8 pm							
435. Actividades después de 8 pm							

Hijos	Lunes	Martes	Miercoles	Jueves	Viernes	Sabado	Domingo
436. Actividades antes de las 8 am							
437. Actividades de 8 am a 12 pm							
438. Actividades de 12 pm a 2 pm							
439. Actividades de 2 pm a 6 pm							
440. Actividades de 6 pm a 8 pm							
441. Actividades después de 8 pm							

INGRESOS NO AGROPECUARIOS

Miembro	Esposo	Esposa	Hijo 1	Hijo 2	Hijo 3	Hijo 4	Hijo 5	Otro	Otro
Desde diciembre 2011, actividades pagadas realizadas fuera del hogar o de la propiedad agrícola									
1. Agricultor peón									
2. Cría de animales peón									
3. Peón en ciudad									
4. Albañil									
5. Conductor, chofer asalariado									
6. Empleado de oficina									
7. Operario de mquinas									
8. Artesano asalariado									
9. Fuerzas armadas o policía									
10. Comercio o venta de productos									
11. Minería									
12. Otro									
Desde diciembre de 2011. Tiempo que trabajó fuera del hogar o de la propiedad familiar/unidad agrícola (Tiempo: numero de días, semanas etc.)									
1. Horas por día									
2. Días por semana									
3. Semanas por mes									
4. Meses									
5. Año									
6. Otro									

Desde enero de 2011. Monto recibido por el trabajo realizado. Ingresos ganados por día, semana, mes, etc. En Bs.									
1. Por hora									
2. Por día									
3. Por semana									
4. Por mes									
Lugar donde trabajó									
1. En la misma comunidad									
2. En otra comunidad o pueblo									
3. En la ciudad									
4. En otro país									

RECURSOS HÍDRICOS

442. ¿Tiene riego para sus cultivos?

443. Fuente para el agua de riego. Vertiente; Río; Laguna; Pozo; Otro

444. Disponibilidad de agua para riego. Permanente; Temporal; Meses (Ene, Feb, Mar, Abr, May, Jun, Ago, Sep, Oct, Nov, Dec)

445. Cultivo y sistema de riego

Cultivo	Frecuencia			Método				Periodo de riego							
	Semanal	Quincinal	Mansual	Surcos	Inunda.	Camellón	Otro	Ago	Sep	Oct	Nov	Dic	Ene	Feb	Mar

PÉRDIDAS

446. Desde diciembre 2011 a la fecha ¿tuvieron pérdidas importantes en su producción? Sí/No

¿Cuáles fueron las causas de la pérdida y cuánto perdió aproximadamente debido a este evento?

Evento	Agrícola		Ganadería		Productos y subproductos	
	Cabtidad	Porcentaje	Cabtidad	Porcentaje	Cabtidad	Porcentaje
1. Sequías						
2. Inundaciones y/o riada						
3. Helada						
4. Granizada						
5. Plagas y enfermedades						
6. Precios bajos						
7. Conflictos sociales o bloqueos						
8. Otro						

447. Las pérdidas afectaron a:

Evento	Efecto sobre				
	Solo su hogar	Toda la comunidad	Actividad agricola	Actividad ganadera	Productos y subproductos
1. Sequías					
2. Inundaciones y/o riada					
3. Helada					
4. Granizada					
5. Plagas y enfermedades					
6. Precios bajos					
7. Conflictos sociales o bloqueos					
8. Otro					

¿En los últimos 20 o 25 años ocurrió algún evento muy fuerte que haya afectado la producción de sus cultivos o su ganado o la comercialización de los mismos, o los haya obligado a migrar en forma temporal? Sí/No

¿Cuáles eventos y en qué año ocurrió?

Evento	Año

CONOCIMIENTO LOCAL

448. Cómo se enteran de cómo va a ser el clima para los siguientes cultivos:

Quinua	Papa	Cañahua	Oca	Tarwi	Ajipa

449. ¿Con qué frecuencia habla sobre el tema? ¿Qué tipo de año dijeron que sería para la producción de este producto (bueno, malo o regular)? ¿Toma en cuenta esa información?

Fuente de la información	Frecuencia		Pronostico del año			Considero información	
	Siempre	A veces	Bueno	Regular	Malo	Sí	No
1. Familieres en la comunidad							
2. Familiares fuera de la comunidad							
3. Vecinos de la comunidad							
4. Vecinos de otras comunidades							

5. Maestro							
6. Técnicos de instituciones u organizaciones							
7. Comerciante							
8. Consulta Almanaque Bristol							
8. Informacion de la radio, periódicos o TV							
10. Indicadores naturales							
1.							
2.							
3.							
11. Indicadores biológicos. ¿Cuáles?							
1.							
2.							
3.							
15. Otro (especificar)							

450. ¿Cuál indicador funcionó mejor?

¿Cómo sabe que va a haber helada? ¿Por qué?

¿Qué hace cuando se presenta una helada?

¿Cómo sabe que va a haber una sequía? ¿Por qué?

¿Qué hace cuando se presenta una sequía?

¿Cómo sabe que va a haber granizo? ¿Por qué?

CAPACITACIÓN

451. ¿Existió capacitación en su zona? Sí/No

452. ¿Capacitación en qué cultivos?

453. Temas de capacitación: Manejo cultivo; Fertilidad suelo; Plagas y enfermedades; Manejo pos cosecha; Comercialización

454. Capacitadores: Municipio; Gobernación; Inst. Gobierno; Asoc. Productores; ONG/Fundación; Otro

ORGANIZACIÓN COMUNAL

Participación en la directiva de la comunidad

455. ¿Ocupa u ocupó algún cargo en su comunidad?

456. ¿Cuál fue el cargo?

457. ¿Cómo le fue durante su gestión?

Participación en asociación de agricultores

458. Participación en asocación: Sí/No

459. Nombre y siglas de la asociación

460. Actividad de la asociación

461. Tiempo desde que es miembro

462. Cargo dentro la asociación

463. Beneficios

Preguntas para los agricultores que NO pertenecen a alguna asociación

464. Razones por las que no está asociado

465. Disposición a asociarse: Sí/no

RECURSOS FINANCIEROS

466. ¿Usted ha tenido que prestarse dinero en los últimos 5 años? Sí/No

467. ¿De quién obtuvo este préstamo? Banco, ONG FFP; Amigos, familiare etc.; Pasanaku; Otro (especificar)

468. ¿Para qué obtuvo este préstamo?

Actividades productivas (Agrícola, pecuaria, transformación, comercialización, etc.)	Actividades familiares (Fiestas sociales, educación, salud, vivienda etc.)
1.	1.
2.	2.
3.	3.
4.	4.

469. ¿Este préstamo le ha dado satisfacción? Sí/No - ¿Por qué?

(**) Given the legth of this survey, it proved to be extremely challenging to conduct it in rural communities. Sometimes data turned out to be inaccurate or incomplete (particularly in certain sections requesting information that was either sensitive - i.e. *Recursos Financieros*, Financial Resources - or difficult for respondents to provide - *Biodiversidad*, Biodiversity, for the reasons explained in 3.3.2 and 5.4.2). However, in Cachilaya and Coromata I endeavoured to make sure that accurate, complete and detailed responses were gathered particularly with reference to specific sections of my interest (*Demografía, Migración, Educación, Tenencia y Uso de la Tierra, Producción Agrícola, Biodiversidad, Transformación, Comercialización, Alimentación, Ingresos no Agropecuarios, Conocimiento Local*: Demography, Migration, Education, Land Tenure and Use, Agricultural Production, Biodiversity, Transformation, Commercialization, Food, Non-agricultural Income, Local Knowledge). I conducted follow-up interviews with the 48 farmers of Cachilaya and Coromata who participated in this survey, to further explore what had emerged from their responses and fill any gaps that were there in the collected data. This survey was one of the sources of information which this thesis is based upon. Data were triangulated through the use - in parallel - of other methods (i.e. participant observation, unstructured and semi-structured interviews, focus groups).